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ployments, and soon grow masculine, seemingly much coarser than their husbands. The methods of agriculture are primitive. The men go armed. The inhabitants live in villages. Houses are built of stone and are either thatched or shingled.

As stated above, Montenegro was an independent Balkan state until 1918, when it became a part of Jugoslavia, a union which should prove satisfactory, since the Montenegrins are united by ties of blood and language with the other states that compose Jugoslavia; but as a matter of fact, the longing for national independence is still strong among the Montenegrins.

The area of Montenegro (1920), as part of the Jugoslav state, is 3,536 square miles, and the population about 238,500. The capital is Cettinje, with a population of 5,500.

Monterey, mŏn-te-rā′, the leading city of northern Mexico. It is a well paved, attractive city. The flat-topped houses are built of stone in the Moorish style. It is situated in a beautiful valley. It is a mining center of importance. Many Americans have invested capital in the gold, silver, and lead mines of the region. There are several railways. A battle was fought here in 1846 between the forces of General Taylor and the Mexicans. The latter defended themselves in their stone houses. The streets were barricaded. It was necessary to drive them from building to building, until the central plaza was reached. Although the Mexican War, as a whole, cannot escape the imputation of an attack made upon a weak neighbor, the engagement of Monterey reflected credit on the bravery of both armies.

Montesquieu, mŏn-tĕs-kū′ (1689-1755), a French philosopher. He was born near Bordeaux. He came of good family and was educated for the law. His real name was Charles de Secondat. An uncle left him a fortune and the title of Baron de Montesquieu by which he is known. He held a judicial position. He became a member of the Bordeaux academy to which he contributed numerous papers. He sent a manuscript to Amsterdam for publication. It appeared under the title of *Persian Letters.* In the guise of letters exchanged by two Persians, he satirized church, state, and society, creating not a little amusement, but arousing the apprehension of the authorities. Voltaire, moved, no doubt, by jealousy, called it a volume of "trumpery" that anybody might write. The reputation of the *Letters* brought Montesquieu to Paris. He was elected a member of the French Academy. He traveled widely from England to Turkey. He then settled down on his estate near Bordeaux to collect rents, improve his property, and indulge his literary taste. He had a fine library and study, fifty feet wide by sixty long, in which he collected the books he coveted. In this delightful retirement he wrote a number of works. His reputation rests on the *Spirit of the Law: or the Relation that Laws Ought to Bear to the Constitution of Each Government, the Manners, Climate, Religion,* etc.

Montessori Method, an adaptation of the kindergarten method of educating children which emphasizes the voluntary action of the child. The method was developed by Doctor Maria Montessori, a physician from the University of Rome. She first applied her methods to the inmates of a feeble minded school with such marked success that the students were able to pass the same examinations as normal children. Its success with normal children under seven years of age created world wide interest.

Montevideo, the capital and metropolis of Uruguay. It is situated on the northern bank of the Rio de la Plata. The name is Spanish, meaning "mountain view." The city lies on a series of low hills. The streets are straight and roomy. The most important buildings are the Parliament House, Government Palace, and National Bank. There are theaters and club buildings. The warehouses and business blocks are imposing and commodious. Though Spanish is the official and leading language of the city, many languages are spoken familiarly on the streets. With regard to waterworks, street railways, telegraph and telephone lines, electric lights, and other improvements, the city is quite modern. It has a university with 4,165 (1920) students and 344 teachers; also preparatory and secondary schools.

The port is visited by steamers of British, German, French and Spanish lines. The population of Montevideo City in 1920 was 361,950. See URUGUAY.

Montezuma. See CORTEZ.

Montfort, Simon de. See HENRY III.

Montgomery, the capital of Alabama. It is located in the central part of the state, on the Alabama River, about 180 miles north of the Gulf of Mexico. It is a great railroad center, and the distributing point for a large territory. The river is navigable to this point for eleven months of the year, and much of the city's commerce is handled by water by way of Mobile, Alabama. Montgomery lies in the heart of the great cotton belt and exports large quantities of baled cotton. Much of the supply of winter fruits and vegetables used in the United States is raised near and distributed through Montgomery. The city has also a large wholesale business. Great iron and coal fields on the north and extensive yellow pine forests on the south, connected with Montgomery by rail, give rise to various industries. Among the city's manufactures are bricks, ice, wagons and carriages, flour, vinegar, crackers, soap, candy, paper boxes, and cigars.

The location of the town on a high bluff overlooking the river, its numerous public parks, its fine old houses, and its handsome public buildings make Montgomery a pleasant residence city. Some of the noteworthy structures are the large union station, the federal building, the Masonic Temple, Estelle Hall, and a Carnegie library. The population in 1910 was 38,136.

Month. See MOON; CALENDAR.

Mont Pelée. See MARTINIQUE.

Montpelier, mŏnt-pēl′yer, the capital city of Vermont. It is situated in a picturesque valley, on the banks of the Winooski River. The surrounding hills yield much granite, for which Montpelier is a shipping point. The handsome state capitol is of this stone and built in the form of a cross with a dome one hundred twenty-four feet high. The city has several libraries, the Wood Art Gallery, a Methodist seminary, a fine hospital, and numerous other public buildings. The waterworks are owned by the city. Among the industries are the quarrying of granite, and the manufacture of machinery, leather, washing machines, piano strings and organs. In 1920 the population was 7,125.

Montreal, Quebec, the metropolis of Canada, is situated on the island of Montreal, 164 miles southwest of Quebec and 420 miles north of New York City. Montreal Island, thirty miles long and from seven to ten miles wide, is situated at the confluence of the Saint Lawrence and Ottawa rivers, and is about 950 miles by water from the Atlantic Ocean. Mount Royal, from which the name of the city derives, rises 753 feet above the level of the sea. The city is the meeting place between inland and ocean navigation.

DESCRIPTIVE. Montreal is a pleasant combination of the past and the present in the matter of city plan and architecture. The Saint Lawrence as it passes the city is about two miles wide, and the longest streets follow, generally, the course of the river. Montreal is situated on the southeast side of the island, and rises gently from the river to the mountain and then more sharply, by means of terraces. Immediately outside the harbor are several small islands, some of which have been made into parks. The city extends along the river for almost ten miles, and extends into the island as far as eight miles at one point.

There are distinctively English and French quarters in Montreal, and the visitor will find French and English names in about equal proportion applied to streets, parks, public buildings, etc. Parks are numerous and well tended; the largest, Mount Royal Park, with an area of 460 acres, is on the mountain. The reservoirs that supply the city with water are in this park. In the very heart of the city is the Place d'Armes, containing a bronze statue of Maissoneuve. Jacques Cartier Square, containing a monument to Lord Nelson, is a show place of the city, and other noteworthy parks and buildings are the Place Viger, Saint Louis Square, Victoria Square, Lafontaine Park, the Chateau de Ramezay, Bonsecours Market, Champ de Mars, Royal Scots and Victoria Rifles armories, the Royal Bank, Bank of British North America, Merchants Bank and Bank of

Commerce, Dominion Square, and such hotels as the Ritz-Carleton, Hotel Place Viger, Windsor and Queen's.

SCHOOLS, CHURCHES, CHARITABLE INSTITUTIONS. Montreal is one of the greatest educational centers in Canada. The educational systems are two — Roman Catholic and Protestant — each having a separate and distinct board of commissioners. The primary public and parochial schools are in every sense modern and are fully adequate to the needs of the large population. There is a protestant high school for boys, another for girls, and a coeducational commercial and technical high school. At the head of the Catholic school system is Laval University. McGill University is the highest Protestant institution. Montreal University, numerous theological, technical and law schools, Fraser Institute, and many well equipped libraries complete the system.

Many of Montreal's churches are very large and of imposing beauty. The first among them is the Roman Catholic Cathedral of Notre Dame, a composite Gothic structure surmounted by two towers each 220 feet high. Two other notable Catholic churches are Saint James Cathedral and the Jesuit Church. The finest Protestant churches are Saint George's, Christ Church Cathedral, Saint James Methodist and Saint Andrews.

Important among the city's charitable institutions are the Grey Nunnery, a hospital and orphan asylum; Nazareth Asylum for Blind Children; Royal Victoria Hospital; Notre Dame Hospital; and Hotel Dieu, a Roman Catholic hospital.

INDUSTRY AND COMMERCE. Aided by cheap and easy transportation and abundant hydro-electric power, Montreal has attained a high place in the industrial and commercial world. In 1921 there were 2,684 factories capitalized at $409,908,133. A partial list of the products includes paints, boots and shoes, furniture, flour and grist, cement, iron and steel, tobacco products, rubber, silk, tools, clothing, sugar, machinery, wagons and electrical goods. There are numerous grain elevators, one with a capacity of 10,000,000 bushels: there is a cold storage plant with 2,000,000 feet of artificial and 2,500,000 feet of dry storage space.

Montreal is served by the Canadian Pacific, Grand Trunk, Canadian Northern, Intercolonial, New York Central, Central Vermont, Delaware & Hudson, Rutland and other railroads, most of which enter the city by the mile-and-a-quarter-long Victoria Jubilee steel bridge.

The harbor is deep and commodious and has eight miles of wharfage and twenty-four two story transit sheds. In 1921 ocean going vessels to the total tonnage of 2,891,956 entered the port. In that year the exports were valued at $193,010,996. The number of vessels from inland waters that called at Montreal in 1921 was 4,577, with a total tonnage of 6,843,494. These figures indicate an increase in Montreal's commerce over former years, and there can be no doubt that the volume will increase still more.

HISTORY. The site of Montreal was visited in 1535 by Jacques Cartier, who found an Indian village at the base of Mount Royal. Champlain found the island in 1611, and, recognizing its strategic position, he planned to establish a settlement; his plans were not executed, however. The first settlement was made by Paul de Chomedy in 1642. Extensive colonization began in 1653, and the order of Sulpicians became owner of the island in 1657. The original settlement, named Ville Marie, was laid out as a city in 1762. All Canada passed to Great Britain in 1763, and from that year onward Montreal's growth was steady. The American colonists visited Montreal in order to solicit Canada's aid in throwing off British rule; it was at this time that Benjamin Franklin founded the Montreal *Gazette,* which is still in existence. After 1800 the city grew rapidly, aided by the Grand Trunk Railway, the ship canal around the rapids of the Saint Lawrence, and the Victoria Bridge. In 1921 Montreal had a population of 706,600. See ST. LAWRENCE; QUEBEC; CANADA.

Monts, Peirre du Guast, Sieur de (1560-1611), a noted French explorer and colonizer of Canada. Born at Saintonge, France, of Catholic parents, M. de Monts

became converted to Protestantism and attached himself to King Henry IV. In 1603 the king made him governor of the French Company of Canada which was given exclusive fur trading rights between latitudes 40° and 50° north. He was given the right to govern this territory, which was named Acadia. With Poutrincourt and Champlain as chief officers, M. de Monts set sail from Harve, France, in 1604. After exploring the Bay of Fundy, they wintered on an island at the mouth of the St. Croix River. In the summer of 1605 the party founded Port Royal on the present site of Annapolis. M. de Monts then returned to France, where he found that his monopoly and success had caused jealousy, and that his privileges had been cancelled. Recovering a part of them, he continued to send out expeditions, in the course of one of which Champlain founded Quebec. Upon the death of Henry IV in 1610, M. de Monts' privileges were again taken away, and he died in poverty.

Moody, Dwight Lyman (1837-1899), an American evangelist. He was born at Northfield, Massachusetts, and died there. A farmer's boy, a shoe salesman in Boston, again a salesman in Chicago, he became interested in the mission work of the latter city. From 1860 on he gave himself up to holding revival services chiefly in connection with the Congregational churches. During the Civil War he worked among the soldiers. At its close he resumed work in Chicago, becoming associated with Ira D. Sankey, the singer, with whom he visited England and Scotland, holding immense meetings. Great meetings were held also in nearly every large city of the Union. An admirer estimates that Mr. Moody addressed in all no less than 50,000,000 people. Toward the close of his labors he made his home at the place of his birth, where he established an academy for girls, one for boys, and a training school for revival workers. He was a man of fervent, simple eloquence, whose sayings linger.

Moody, William Vaughn (1869-1910), an American poet and playwright, was born at Spencer, Indiana. He was a graduate of Harvard University, and taught English there, at Radcliffe, and at the University of Chicago. As a poet he was very prominent in his day. Among his best works are *The Masque of Judgment, The Fire Bringer, The Great Divide,* a drama, and *The Faith-Healer.* That he died at the prime of life was greatly lamented by admirers of his very notable art.

Moon, a heavenly body revolving about the earth. The moon is not a star, nor is it a planet; it is a satellite. The origin of the moon has been a mooted question. It is now considered that it is of solar, not terrestrial origin; that it was thrown off by the sun, and that after traveling for a time about the sun as a small planet, it came within the influence of our earth and was captured by the larger planet, since which time it has revolved about a new center. It is held that the earth never rotated with sufficient velocity to throw off the moon. Next to the sun, it is the heavenly body of most interest and importance.

The moon travels about the earth in an orbit about 238,840 miles distant. Its orbit is more elliptical than that of the earth, and its average distance from the earth is about $\frac{1}{390}$ of the earth's mean distance from the sun. In its orbit the moon travels at an average rate of 2,287 miles an hour, and completes its circuit in a trifle over twenty-nine and one-half days. It turns on its axis once each sidereal month, and thus keeps the same side toward us all the time. The man in the moon is nearly the same that the children of Israel saw in their wanderings. The diameter of the moon is about one-fourth that of the earth; forty-nine moons would equal the earth in volume and eighty-one would weigh as much. The density of the moon is 3.4; of the earth 5.6.

The moon has no light of its own. It shines by the light of the sun. The half of the moon that is in the light of the sun is called its face. Twice a month the sun, earth, and moon are nearly in a line. At the moment when the moon crosses this line we cannot see any part of its bright face. Astronomers then say the moon is new. In a day or two we see a crescent rim and speak of the new moon. In a week the bright portion becomes a semicircle. In another week the moon is on the side oppo-

THE MOON

This is a photograph of the Moon as seen through the telescope of the Yerkes Observatory

site the sun, and we see it full in the face and speak of a full moon. As Tennyson puts it,

> The silver sickle of that month
> Became her golden shield.

The visible portion then diminishes to a semicircle and finally to a new moon again. In the latitude of St. Louis the moon rises and sets later each day, by from twenty-three to seventy-seven minutes. Children living in northern Europe see the moon at certain seasons for an entire day at a time. The full moon that comes the month of the autumnal equinox seems to shine with a peculiarly soft, refulgent light. While nearly full it rises for several successive nights at about the same hour and is called the harvest moon. The following moon is called the hunter's moon for a similar reason.

Moonlight is not infrequently strong enough to read by, but it is not over one six hundred thousandth part as strong as sunlight. If the sky were entirely paved with lights each one being equal to that of the moon, they would not yield over one-eighth as much light as is derived from the sun.

The moon appears to be without an atmosphere. As its days and nights are fourteen of our days in length it is evident that the noon hour is intensely hot and midnight frightfully cold. Under a telescope the surface of the moon presents a pitted, smallpox appearance, due to the presence of the craters of extinct volcanoes. Many of these craters are from five to ten, twenty, fifty, sixty, or even one hundred miles in diameter One of the largest has been named Copernicus in honor of the great astronomer. The weight of opinion is to the effect that the surface of the moon is of barren rock without water, snow, vegetation, seasons, or even storms. Present investigations are being carried on by means of telescopic photography, which was started in America about the middle of the nineteenth century.

A foolish notion once prevailed that moonlight was a cause of madness, whence the Latin term of lunatic and the English term, moonstruck.

The moon has always been a favorite with children. The man in the moon with his round, good-natured visage seems to look down kindly on upturned faces. Jean Ingelow has a pretty conceit in her *Seven Times One:*

> O moon, in the night I have seen you sailing
> And shining so round and low,
> You were bright; ah, bright; but your light is failing,
> You are nothing now but a bow.
>
> You moon, have you done something wrong in heaven,
> That God has hidden your face?
> I hope if you have you will be forgiven,
> And shine again in your place.

See TIDES; ECLIPSE; INSANITY.

Moonshiner, a term applied to an illegal maker of whiskey. The government tax on whiskey is so large that many secret stills are hidden away, particularly in the mountains of Tennessee and Kentucky, with the purpose of evading payment. The inhabitants of such a district see no harm in making their own whiskey and drinking it without payment of a whiskey tax. They naturally conceal the locality of a still and watch the movements of every stranger. Though naturally hospitable, they have no mercy on a spy or detective. Many sudden deaths from ambush and many a thrilling tale of adventure may be told in connection with the collection of internal revenue. The moonshiners are likely to do much of their work by night, whence the name. Charles Egbert Craddock's stories of Tennessee life give an excellent idea of eastern Tennessee mountains and moonshiners.

Moore, mōr, **Thomas** (1779-1852), an Irish poet. He was born at Dublin and was educated at Trinity College. He studied law. Byron for England, Burns for Scotland, and Moore for Ireland may be associated conveniently in the student's mind. All were popular writers, all three were dissipated and unchaste in life; but similarity stops here. Byron was terribly in earnest in his bitterness; Burns was at heart reverent and true; Moore was a successful fashionable rake, lacking in depth and sincerity. He began to write verses when a boy. While at Dublin University he translated the *Odes of Anacreon.* His early volumes of poetry were criticized severely but were widely read. In the *Edinburgh Review* Moore was denounced as a "corruptor of morals." A duel between the editor, Jeffrey, and Moore was the result of this criticism. Byron made sport of the affair and it was said that the

pistols were loaded with saltpeter. However that may be, neither of the participants was hurt and they became excellent friends thereafter.

Lalla Rookh is a society rendering in verse of four gaudy eastern tales. It sold wonderfully and brought the author $15,000. *The Fudge Family in Paris* is written in a lighter vein.

Moore wrote a number of prose works, among them biographies of Lord Edward Fitzgerald, Richard Brinsley Sheridan, and Lord Byron. His life of Byron is the best biography we have of that author, the two poets having been personal friends.

Moore's *Irish Melodies,* a collection of songs and lyrics, is the volume upon which his reputation rests. He had engaged with a publisher in 1807 to write these songs and produced them at intervals during the next twenty-five years. They are pleasing and graceful, not lacking in pathos and sweetness. Many of them have been set to music and mean much more when sung than they can ever mean in the reading. There is scarcely an English-speaking person who has not a favorite among them. "'Tis the last rose of summer," "Oft in the stilly night," "The harp that once through Tara's halls the soul of music shed," "Come, ye disconsolate, where'er ye languish," "Sound the loud timbrel o'er Egypt's dark sea!" "Those evening bells," are among the well known songs which will make Moore's name remembered.

See EMMET; DUBLIN.

QUOTATIONS FROM MOORE.

Go where glory waits thee!

This world is all a fleeting show.

But the trail of the serpent is over them all.

But there's nothing half so sweet in life
As love's young dream.

Whose wit in the combat as gentle as bright
Ne'er carried a heart-stain away on its blade.

You may break, you may shatter, the vase if you will,
But the scent of the roses will hang round it still.

Joy, joy forever! my task is done,
The gates are passed, and Heaven is won!

SAID OF MOORE.

Rarely has there been such an artist of harmony.—Welsh.

Happiness of nature and felicity of genius are the pre-eminent characteristics of the bard of Erin.—Hazlitt.

Burns and Moore stand side by side as the lyrists of two kindred nations. But the works of the latter, polished and surpassingly sweet as they are, have something of the drawing-room sheen about them, which does not find its way to the heart so readily as the simple grace of the unconventional Ayrshire peasant.—Collier.

Despite his popularity during his lifetime, Moore can hardly be placed in the rank of great poets. His muse is a spangled dancing girl—light, airy, graceful, but nothing more.—Chambers.

Moors, an Arabic people, now occupying the Barbary states. They were originally Arabs, but they have absorbed various elements. The Moors entered Europe from Africa by way of Spain. They were turned back by Charles Martel at the battle of Tours, 732. They were Mohammedans, speaking the Arabic language. They built cities in Spain and established extensive irrigation systems. They were for a time dominant, but the native Spaniard gained the ascendancy and began a system of repression in some respects reminding the reader of the agitation against the Huguenots in France. Ferdinand crushed the military power of the Moors in 1492. In 1610 the last of them were expelled, leaving Spain the poorer in learning as well as in industrial respects. See ALHAMBRA; ARABS.

Moose, an American animal of the elk tribe. It is the largest living animal of the deer family. An adult male measures from five and one-half to seven feet at the shoulder, and attains a weight of a thousand or fifteen hundred pounds. The moose is larger than a horse. It is still found locally in swampy, evergreen forests from Maine to Washington and northwestward to Alaska. Sportsmen bring 250 moose out of Maine each season. No doubt as many more are killed by local hunters. The male may be recognized at once by a pair of magnificent spreading antlers with broad branches flattened into palms in a direction parallel to the sides of the head. A pair of antlers will often weigh from forty to fifty pounds. An Alaskan moosehead hanging in the Field Columbian Museum at Chicago has the largest moose antlers on record. There are thirty-four tips. The greatest

palm is sixteen inches wide and is over two inches thick. The total spread at the widest point is seventy-eight and one-half inches. The hair of the moose is of an iron-gray color. It is long, thick, and coarse. It lies like a thatch and is a perfect protection against sleet, rain, and cold. Each hair is a hollow tube, like that of the reindeer. So many tiny life preservers give the moose buoyancy in the water. An ornamental tufted, pouch-shaped fold of skin drops like a purse below the under jaw. It is from four to twelve inches long. The tail is a mere stump.

The legs are straight and strong. They raise the body four feet clear of the ground. When alarmed the moose can make off at an incredible speed. Although heavy as an ox, it is fond of wading in sinking bogs. For the love of a bath, in fly time it plunges in where a horse would be lost, or it dives to the bottom of a lake for desired food.

The moose is a browsing animal. It would die if required to feed on grass. Twigs of hemlock, spruce, alder, poplar, birch, willow, maple and the bark of trees are its food. Its legs are so long that it must kneel to reach grass. In winter, like its relative, the reindeer, the moose digs holes in the snow to reach moss. In time of deep snow moose are apt to herd together, trampling down the snow, and forming what hunters call moose pens. The moose is ordinarily an inoffensive animal, but when enraged by a bullet wound, or other provocation, the bull charges with blind fury, and those experienced in the ways of the moose keep at a safe distance. The cow has one calf each spring. The various states have made provisions to save the moose from extermination.

Moosejaw, Saskatchewan, an important industrial and commercial city, is on the Moosejaw River, 398 miles west of Winnipeg and 420 miles east of Calgary. It is a division point on the Canadian Pacific Railroad, and is also served by the Grand Trunk and Canadian Northern roads.

Moosejaw is in the heart of an extremely fertile wheat growing district, and a government grain elevator in the city has a capacity of 3,500,000 bushels. There are manufactories of lumber, flour, abbattoir products, machine shop and foundry products, sashe and doors, face and pressed bricks, tiles and pottery, boxes, refined oil and other articles. The city has an extensive wholesale trade in some of these articles and in farm and dairy products.

There are three parks in the city, and places of recreation have been established on the river. The Y. M. C. A., city hall, Land Titles Building, court house and the Canadian National, Empress and Royal George hotels are among the most noteworthy buildings. The city has churches of all denominations, and the educational system comprises twelve public schools, two collegiate institutions, a boys' school, a conservatory of music, two business colleges and a library. Moosejaw has had a rapid growth, and its future importance is assured. In 1901 the population was only 1,558; ten years later it was 13,823; and in 1921 it had reached 19,285.

Moqui, mō′ki, a tribe of North American Indians. The native name is Hopi, meaning peaceful people; but the present name of Moqui, by which the tribe is known, is an Apache nickname signifying "dead men." The Moqui live in northern Arizona. They were visited by Coronado in 1540. They revolted against the Spaniards in 1680 and regained their independence. The Moqui country may be reached from Winslow or Holbrook on the Santa Fé route by an overland journey of eighty miles across the Painted Desert.

The Indians, some 1,600 in number, live in eight villages built on three projecting points or precipitous mesas of a vast table land. It is six miles from the first mesa to the second, and ten miles farther on to the third. In early days logs were used for floor joists, and entrance to the various stories was gained by ladders and trapdoors through the ceiling. On the approach of an enemy, the villagers not only defended the steep pathways up the faces, 700 feet high, of the mesa, but, if pressed too hard, were wont to climb up their ladders to the roofs of the houses, pull their ladders after them, and drop down through their "skylights" into safety within. Now that the Navajo and the Apache ride their raids no more, the **Hopi,**

as they should be called, are cutting doors and windows through the walls.

The principal industry of Hopi land is agriculture. The soil is sandy and dry. There is no water for irrigation. About 2,500 acres are planted in corn each year. This is a small corn yielding not over ten bushels to the acre, but it furnishes the chief article of diet. Spanish missionaries introduced the peach. A thousand acres are set with peach orchards. There are gardens of beans, melons, squashes, pumpkins, onions, and sunflowers. Small quantities of wheat, cotton, and tobacco are raised. The men, contrary to ordinary Indian custom, do the greater part of the agricultural work. In time of food scarcity, mescal, which is a sort of cactus, together with other plants of the desert, is eaten. The hunters sally out also for jackrabbits, prairie dogs, and coyotes.

The Hopi own flocks of sheep and goats and a few cattle. Wool is sold to Indian traders or is woven into blankets. The Hopi taught the Navajos to weave and are now excelled by them, but still the Hopi blanket is a serviceable article. The men do the weaving and keep the blankets for home use. The Hopi are famous for pottery and baskets. These articles are made by the women. The basketry is made of stained native grasses and the fibers of the aloe. The decorations of the earthenware and the patterns of the baskets and plaques have each its own significance, for the old men and women hand down an ancient mythology all their own.

These people are, of course, superstitious. It is not strange in a land of drouth that they should venerate the power that causes a spring to flow or a stream to run even temporarily. Like the Greeks, they propitiate a local deity for each fountain, each stream, each pool. They practice incantations for clouds, for rains, for crops, for the averting of epidemics. The villagers are divided into clans, and each clan is held to see to it that the deities of a particular clan take no offense. The great ceremonial of the year is the snake dance. This dance is performed by the snake clan of each village. Live rattlesnakes are carried by the dancers and are released at the proper time, that they may go far down into the earth and influence the great Snake Mother to release the reservoir of waters by which the clouds are fed. Occasionally a dancer is bitten, but the squaws have an infallible herb antidote for snake bites. The method of preparation is a religious secret which no white man may share.

Most unusual of all is the superior position of the squaw. She is the house-owner, the head of the family. Marriageable maidens wear the hair in large, open whorls, one over each ear. The whorl represents a squash blossom, the Hopi emblem of virginity. These whorls are taken down on the wedding day and henceforth the squaw wears her hair in two rolls, one hanging on each side of her face. These represent the fruit of the squash, emblem of fertility. Inscriptions found in the cliff dwellings indicate that this picturesque custom was once common among southwestern tribes, but it lingers now only among the Hopi. Marriages are arranged by the women folks. On his wedding day the Hopi brave goes to live in the house of his wife. She owns the household gear, present and future. The children are known by her name. The men are said to be smaller than the women and less bright. The men, as stated, do their full share of work. They labor in the field, they weave, they knit, and are in general much more dutiful than the ordinary aboriginal husband.

Moraine. See GLACIER.

Morality. See MIRACLE PLAY.

Moravia, formerly a province of Austria-Hungary, now a part of the new republic of Czecho-Slovakia. It is rich in minerals and possesses a fertile soil. The province is of especial interest to Americans on account of the part played by Moravians in the early settlement of this country. Moravia and Bohemia were among the earliest centers of the Protestant Reformation. The leaders were Huss and Jerome. The Protestants were subjected to severe persecution. Though at one time numbering 200,000 members and having over 400 churches, they were abandoned by the Protestant nations of Europe to the Austrian authorities at the Peace of Westphalia in 1648. They were compelled to return to the Catholic church or leave the country. Many migrated to Saxony, North Germany,

Holland, and elsewhere. About 1740 they began to settle in Pennsylvania. They were aided by a Count Zinzendorf. They planted a large number of villages. Bethlehem was, and still is, their center. Up to the middle of the nineteenth century they were exclusive in their manners, guarding their language and customs with religious fidelity. During the last fifty years, however, they have Americanized rapidly. The church, known as the United Brethren, has extended into other states and territories. There are 376,182 members. During the Revolutionary War they were loyal to the American cause. Read *Hymn of the Moravian Nuns* by Longfellow.

Mordant. See DYEING.

More, Hannah (1745-1833), an English writer. She was born at Stapleton. As a girl she went to a school in Bristol conducted by her older sisters, though learning a great deal at home for her father was a schoolmaster of fine scholarship. Even as a child she amused herself by writing, and when only seventeen produced a comedy that, though very youthful in thought, showed unusual command of English. She was a very pretty girl, with a delicate, thoughtful face. Though usually called Mrs. More, it is merely out of respect, in accordance with an old fashion, for she never married. When she was twenty-two she was taken by two school friends for a visit at the house of their guardian and cousin, Mr. Turner, the squire of Belmont. That elderly gentleman was charmed by the bright young girl. The verses which she wrote about various lovely spots on his estates he had painted on boards, strongly resembling warnings to trespassers, and fastened to trees, where they could be seen many years afterward. Finally he proposed to her, and she accepted him. She bought her trousseau and set the wedding day. But the squire deferred the event several times, until her family grew indignant, asked a family friend to see the squire, and had the engagement broken off. The explanation of the strange affair lies probably in the deep-seated caution of an elderly person who feared he had acted rashly. Mr. Turner insisted upon making some compensation in money, but Miss More would not permit it. Finally the squire without her knowledge arranged for an annuity to be settled upon her, which she was at last led to accept. At his death he left her a thousand pounds. The queer old gentleman always spoke of her with the greatest respect, and seemed to regret the affair deeply. It must have hardened Miss More a little for she rejected other offers.

After this experience she went to London where her friends were such brilliant literary lights as Dr. Johnson, Burke, and Garrick. That great actor made popular several of her plays. A few years of polite London society made Miss Hannah long for something more satisfying, so she turned her attention to philanthropy. The rest of her life was spent in establishing schools for the neglected children of certain country districts of the rough mining towns. In these religion and a trade were taught. Her writings were now of an intensely moral turn, and include *Strictures on the Modern System of Female Education, Hints Toward Forming the Character of a Young Princess, Coelebs in Search of a Wife, Christian Morals,* and *Moral Sketches of the Prevailing Opinions and Manners, Foreign and Domestic.*

More, Sir Thomas (1478-1535), an English statesman and writer. He was born in London and educated at Oxford. He was a brilliant lawyer and became a member of Parliament. He opposed a demand for a royal subsidy. He served England as a diplomat and was for a time chancellor. He was a staunch Catholic. He refused to recognize Henry VIII as head of the church, and was beheaded therefor for treason. As a writer he is known as the author of *Utopia,* a Latin treatise on an ideal state in a land of nowhere. It was translated in 1551. This is the first political romance. It belongs to the same class of works as Bacon's *New Atlantis* and Bellamy's *Looking Backward.* See UTOPIA.

Morgan, John Hunt (1826-1864), a famous Confederate general. He was born in Huntsville, Alabama, and when but a boy was taken to Lexington, Kentucky. He enlisted in the Mexican War as lieutenant. When the Civil War broke out he left his prosperous business, organized a company of two hundred men, and went over to the Confederate lines with his band. He

distinguished himself as a daring raider, able as were few other men to strike a swift blow and get away unharmed. In 1862 he had command of a cavalry force under Bragg. The next year he commanded an independent force in a series of famous raids into Kentucky and Ohio. There he destroyed millions of dollars worth of property, tore up railroads, cut telegraph wires, and burned bridges, moving with a swiftness and daring that defied capture. He was caught, however, in December and imprisoned in the Ohio penitentiary, but escaped through an underground tunnel. In 1864 he led fresh raids in Tennessee. One night while stationed in a farmhouse near Greenville he was surrounded by a body of Federal troops, and attempting to escape was shot and instantly killed.

Morgan, John Pierpont (1837-1913), American financier. He was born at Hartford, Connecticut, the son of Junius S. Morgan, a noted financier. He studied in the English High School of Boston and at the University of Göttingen, Germany. When twenty years old he returned to the United States, and entered a banking house in New York. He has been a member of numerous business houses in both New York and London, seeming to make everything he touched turn into gold. His genius for organization carried him through the most venturesome schemes with flying colors. In 1901 he succeeded in combining nine great eastern railways into a single system of which he was the head. His next maneuver in "high finance" was to organize the steel trust with a capital of $1,100,000,000. He owned a large Atlantic steamship line, and was the head of the anthracite and soft coal trusts. He also played a part in national finance, having floated a government bond issue of $62,000,000 in 1895. Many institutions and individuals have benefited at his hand. The Cathedral of St. John the Divine in New York, received a gift of half a million dollars, Harvard Medical School one of a million. Though one may have doubts as to the ethics of Mr. Morgan's methods of high finance, one cannot question his great generosity.

Morgantown, W. Va., an industrial and mining city and the county seat of Monongalia County. It is on the Monongahela River, 101 miles south of Pittsburgh, Pa. It is served by the Baltimore & Ohio, the Monongahela, the Morgantown & Kingwood and the Morgantown & Wheeling railroads. The surrounding country is rich in coal, glass sand, natural gas, oil, limestone and clay. The principal manufactures are window glass, wire glass, flint glass, mirrors, tin plate and bricks. The mining of the coal of the surrounding country which began during the war has developed to such an extent that the output of this district is 15,000 tons daily.

Morgantown is the seat of West Virginia University (See WEST VIRGINIA, subhead *Education*). The city has a Federal building, library, courthouse, hotel and several handsome churches. In 1920 the population was 12,127.

Morley, John (1838-), an English statesman and author. He was born at Blackburn, Lancashire. His education was received at Oxford. Soon after graduating he became editor of the *Literary Gazette* of London and was thereafter editor successively of the *Morning Star,* the *Fortnightly Review, Macmillan's Magazine* and *The Pall Mall Gazette.*

His political career began in 1883 when he was returned to Parliament for Newcastle-upon-Tyne. Three years later he was made secretary for Ireland, under Gladstone, holding the office until 1896. He played an important part in the debates on the Home Rule Bill, in 1893. From 1896 to 1908 Morley sat in Parliament, being appointed secretary of state for India in 1905, which position he resigned in 1910 to become Lord President of the Council of Great Britain. His writings include a series of biographies, *Edmund Burke, Rousseau, Voltaire, Diderot and the Encyclopaedists,* and *Richard Cobden.* Other works are *Critical Miscellanies, Walpole, Studies in Literature, Oliver Cromwell, Life of Gladstone.* He edited the series entitled *English Men of Letters,* in which the essay on Burke is his own production.

Mormons, the church of Latter Day Saints. An American religious sect. It was founded by Joseph Smith at Fayette, New York, in 1830. In this year he published *The Book of the Mormon People,*

purporting to be a translation of the inscriptions on certain golden plates shown to him by an angel as early as 1823. The plates were never made public, but the book was accompanied by a certificate from eleven men saying that they had seen them. The book gives an account of the miraculous migration of King Zedekiah of Jerusalem and others from Palestine to America, where they became the ancestors and chiefs of Indian tribes. Mormon, the hero of the book, was a pious Christian chief who rescued the red man from idolatry. The new sect gathered several hundred members within a few months and then moved to Kirtland, Ohio. Zealous missionaries added new recruits. In 1831 the sect began to centralize in Jackson County, Missouri. In 1833 the Mormons were driven out of the county, being objected to both on account of their religious views and the fact that they were Abolitionists. They then settled in Clay County. In 1838 they were, by proclamation of the governor, expelled from the state. They next settled in Hancock County, Illinois, where they built the Mormon town of Nauvoo. Here they built a handsome temple according to plans drawn by Smith, and seemed likely to prosper. Charges of immorality against Smith and his leading followers got abroad. Prejudice was added to fact; Smith and his brother Hyrum were arrested and lodged in the county jail for breaking up an objectionable printing office in Nauvoo. There was talk of organizing a force of volunteer militia to drive the Mormons out of the state. June 27, 1844, a mob surrounded the county jail and overpowered the jailor and guards. Smith and his brother were taken out and killed, and other leaders were maltreated. Brigham Young was then promoted to the leadership of the church.

In 1846 he and a committee of others went west to look up a new home. In 1847 they conducted a company to the Great Salt Lake Valley. It was then a mere alkali desert surrounding the lake. The colony endured great privations, almost perishing of starvation. They constructed irrigation ditches from the surrounding mountains and soon made "the wilderness blossom like the rose." The city of Salt Lake was founded. It became an important station in the wagon route to California. Missionaries were sent throughout the United States and Europe to beat up recruits. The colony grew. The agricultural region was extended. Brigham Young died in 1877. Subsequent presidents of the church have been Taylor, Woodruff, and Snow. In 1901 Joseph Smith, a nephew of the founder, was made president.

The Mormons hold to a belief in the Trinity, in future punishment, and in the atonement of Christ. They practice baptism. They believe that Zion will one day be restored. The government of the church is what is known as a theocracy. The president is supreme. He is assisted by two counselors. There are twelve apostles and a regular gradation of patriarchs, high priests, elders and bishops, preachers and teachers. The distinguishing tenet of Mormonism was polygamy. Following the example of the Old Testament patriarchs, they maintained that it was not only the privilege but the duty of each man to wed and maintain as many wives as his means would permit. This tenet of their faith was not promulgated until they had settled in Utah.

As early as 1862 the general government of the United States passed a law forbidding polygamy. The act was ignored until 1884, when over 1,000 members of the church were sent to the penitentiary by the United States courts. The authorities, acting under the Edmunds law, ordered the Mormon church, as such, to disband, and confiscated the greater part of its property. In 1890 rather than suffer further persecution, as they termed it, the authorities of the church, through President Woodruff, issued a proclamation forbidding future polygamous marriages. The membership of the Mormon church is now reckoned at about 588,000. The Mormons are increasing in the irrigated districts of states adjacent to Utah.

For an account of the famous Mormon tabernacle and temple, see SALT LAKE CITY. See also UTAH.

Morning Glory, a well known flowering plant. There are well on to 500 closely related twiners in the entire group. Our

beautiful garden morning glories, now advertised by seedsmen, are mostly from Japan. The morning glory is raised easily. Seeds soaked a few hours in warm water before planting have been known to produce flowers in six weeks. The name is derived, of course, from the fact that the flowers, crimson, yellow, blue, violet, purple, pink, rose, and white are at their best in the morning hours. The florists of Japan have taken a deep interest in the development of morning glories. In 1830 a craze for a special sort led to the payment of from $10 to $18 reckoned in our money, for single seeds. Quite a literature of these plants, richly illustrated, exists in the Japanese language. The sweet potato is a prosaic relative.

Morocco, an empire of northwestern Africa, bordering on the Mediterranean Ocean. The name is Arabic, meaning the "extreme west." The interior boundary is rather indefinite, somewhere in the Sahara Desert. The area is about 231,500 square miles. The ruler, known as the sultan, has three residences or capitals, the principal of which is Fez. The backbone of the country is the Atlas range. There are stretches of sand, of grassy table lands, and of plains well watered, and of great fertility. The temperature of oceanic Morocco, west of the Atlas Mountains, ranges from 40° to 95°. The heat of the interior is insufferable. There is mineral wealth in the Atlas Mountains, but its extent is little known. Small quantities of copper, iron, and lead are mined. The cork oak, the cedar, pine, juniper, and date palm are the principal trees. The lion, panther, wild boar, and gazelle are still found in the wilder parts of the country. The cultivators of the soil are much plagued by hordes of locusts. Supplies of ostrich feathers are obtained from the Sahara border. Though, as stated, portions of the country are naturally fertile, agriculture is in a deplorable condition. Wheat, barley, corn, millet, beans, and grapes grow well, but there is little security for property. The chief wealth of the country consists in sheep and goats. The hides of the latter furnish the well known Morocco leather of commerce.

Tangier is the principal port. There are exports of almonds, goat skins, wool, wax, ostrich feathers, asafoetida, coal dust, ivory, beans, and peas. The country is without roads, railways, or canals. The people are, for the most part, Mohammedans. The ancient populace, known as Berbers, are largely agricultural. The Berbers constitute two-thirds of the population. They are a white people, possibly the oldest known, antedating, it is thought, the Phoenicians, the Carthaginians, and the Romans. The dominant or Arabic element is largely nomadic, and is concerned chiefly in stock-raising. The education offered in the cities themselves goes little beyond a study of the Koran. Commerce is in the hands largely of the Jews and of the descendants of the Moors who were expelled from Spain. An extensive caravan trade is conducted with the oases of the Sahara and with Timbuctoo. The mountainous portions of the country are overrun by brigands. The sultan extorts millions annually from his wretched people. By a treaty signed by the Sultan in March, 1912, Morocco became a French protectorate on almost the same terms as those under which Tunis is now governed, with a government by a French Resident General and other French officials who exercise their authority through natives.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	231,500
Population (1920)	6,000,000
Chief cities:	
Marakesh	102,107
Casablanca	101,690
Fez	62,693
Tangier	50,000
Revenue of French zone	$50,000,000
Bonded indebtedness	$105,000,000
Wheat, bushels	17,466,000
Corn, bushels	3,726,000
Oats, bushels	149,630
Barley, bushels	29,510,000
Flax seed, bushels	1,017,620
Domestic animals:	
Horses and mules	193,547
Asses	414,600
Camels	98,495
Cattle	1,494,173
Sheep	6,708,728
Goats	2,078,658
Swine	132,240
Iron ore, tons	211,944
Silver ore, tons	7
Phosphate rock, tons	379,000
Imports	$200,000,000

Exports	$50,000,000
Miles of railway	814
Teachers in public schools	793
Pupils enrolled	24,059

See FEZ; TIMBUCTOO.

Morpheus, in Roman mythology, the god of dreams. He was the son of Somnus, god of sleep. The word Morpheus means fashioner or moulder, and the god was supposed to shape or form the dreams which appeared to the sleeper. He is represented in art as a winged child, asleep and holding a vase in one hand and poppies in the other. See SOMNUS.

Morphine. See OPIUM.

Morrill, Justin Smith (1810-1898), an American legislator whose efforts to establish state agricultural colleges, though long combated, were finally successful. He was born at Stafford, Vt., and after receiving an elementary education, engaged in farming until 1855. He had applied himself to serious study, however, and in 1854 was elected to Congress. After being reelected to the House of Representatives several times, he took a seat in the Senate in 1867, serving continuously until his death. He was a member, and for some years chairman, of the Senate Committee on Finance. In 1857 Mr. Morrill introduced a bill for the establishment, through the aid of public land grants, of state colleges for the purpose of teaching agriculture and the mechanic arts. President Buchanan vetoed this bill, but President Lincoln signed it in 1862. Mr. Morrill vigorously opposed government paper money, and also the annexation of territory by the United States.

Morris, Alexander (1826-89), a Canadian statesman, was born at Perth, Ontario. He was educated at the McGill University, Montreal, and at the University of Glasgow. He studied law, and was admitted to the bar in 1851. In 1861 Morris was elected a Conservative member of the Canada Legislative Assembly; in 1867 he became a member of the first Dominion Parliament, and in 1869 was appointed Minister of Inland Revenue in the first administration of Sir John A. Macdonald. In 1872 he was made chief justice of the court of queen's bench of Manitoba, but resigned in the same year to become lieutenant governor of Manitoba and the Northwest Territories. On his return to Ontario in 1877, he became a member of the Ontario legislature, holding this office until 1886. Mr. Morris was an author, and published *Canada and her Resources, Treaties of Canada with the Indians of the Northwest* and *Nova Britannica.*

Morris, Clara (1849-), an American actress. She was born at Toronto, Canada, but her childhood was passed in Cleveland, Ohio. She was trained for the stage by John Ellslers, whose ballet at the Academy of Music she joined in 1864. In 1869 she became leading lady at Wood's Theater in Cincinnati, and the following year joined Augustin Daly's Fifth Avenue company at New York. In 1871 she scored a great success as Annie Sylvester in *Man and Wife,* and was thereafter very popular in emotional parts until ill health necessitated her retirement from the stage. She is remembered best, perhaps, in the role of Camille. In 1874 she married Frederick C. Harriott. Since her retirement she has published a number of books and has contributed largely to periodicals. Her books include *Little Jim Crow, A Pasteboard Crown, Life on the Stage, The Life of a Star, Personal Experiences and Recollections* and *The Trouble Woman.*

Morris, Gouverneur (1752-1816), an American diplomat and statesman who assisted in drafting the Constitution of the United States. He was born in Morrisania, N. Y., and was graduated from King's College in 1768. Chosen to represent Westchester County in the first Provincial Congress of New York in 1775, Mr. Morris soon became prominent as an advocate of the American cause. He helped to draft the New York state constitution in 1776, and from 1777 to 1780 served in the Continental Congress. In 1781 he became assistant superintendent of finance under Robert Morris. He was a delegate to the Constitutional Convention in 1787, and was a staunch supporter of Alexander Hamilton. Mr. Morris was sent as minister to France in 1792, sat in the United States Senate from 1800 to 1803, and in 1810 was appointed chairman of the Erie Canal Commission. He wrote several pamphlets on taxation and currency, and contributed

political satires to the press. His literary style was very forceful and eloquent, and he composed many of the state documents of the time. In 1888 Roosevelt published his life history in *The American Statesmen.* His great-grandson and namesake is a very popular writer of short stories.

Morris, Gouverneur (1876-), an American novelist and a great-grandson of the American statesman of the same name, was born at New York City and graduated from Yale University in 1898. While still a student at Yale Mr. Morris began contributing stories to American periodicals, and his first novel, *A Bunch of Grapes,* was published in 1897. This book was well received, and was followed in 1901 by *Tom Beauling.* Mr. Morris' stories are principally of the popular, adventure type, touched with humor, and they afford pleasant reading. His principal works are, in addition to those named above, *The Voice in the Rice, The Pagan's Progress, When My Ship Comes In, The Footprint and Other Stories, The Seven Darlings, His Daughter, The Wild Goose* and *Yellow Men and Gold.*

Morris, Sir Lewis (1834-1907), a Welsh poet. He was born at Carmarthen, Wales. He was educated at Oxford and was admitted to the bar in 1861. He is the author of several volumes of poetry. The best known is the *Epic of Hades.* Other titles are *Songs of Two Worlds; Gwen: A Drama in Monologue; The Ode of a Life,* and *A Vision of Saints.* Morris' verse is easy and pleasing, though by no means strong. It has been popular, especially in England.

Morris, Robert (1734-1806), an American patriot and financier. He was born at Liverpool, England. He migrated to America and entered a Philadelphia merchant's counting room in 1747. At the outbreak of the American Revolution he was one of the wealthiest men in the colonies. He opposed the Stamp Act. He was a member of the Continental Congress of 1775. He voted against the Declaration of Independence, but afterward signed with the other members. During the dark days of the colonial cause Morris was invaluable. He looked after supplies by sea and secured loans and contributions for the use of Congress. On one occasion he raised $50,000 on his own notes for the payment of the Continental troops. He was one of Washington's staunchest supporters. Morris was a member of the convention that framed the Constitution. He declined a cabinet position in favor of Alexander Hamilton. He represented Pennsylvania in the United States Senate. When the city of Washington was laid out Morris speculated heavily, investing $48,000 in six hundred lots. He undertook to build twenty brick houses a year. He fell into difficulties and was imprisoned for debt.

Morris, William (1834-1896), an English poet, storyteller, craftsman, and social reformer. He was born at Walthamstow, Essex, and received his education at Oxford University. To understand Morris' many-sided genius, it must be borne in mind that he is preëminently an artist—an "Artist of the Beautiful," Stedman calls him. His work has been important in several directions. While his influence in the matter of household furnishings and decoration will be permanent, his name will be known longest and most widely for his poems. His poems are narrative. They are often epical in character. Full of charming fancies, but displaying no lofty imagination, they are restful, never soul-stirring. Above all and through all, they are beautiful. It is the artist who gives them their chief charm.

Morris takes Chaucer as master and model. His sources are all old, but cover a wide field. He searches for the rare, the curious, and takes it from the classical or oriental writers, from the *Gesta Romanorum,* from the *Eddas* of Iceland, or from the British romances of Malory. His first poem, published in 1858, was *The Defense of Guinevere.* Some years later *The Life and Death of Jason* appeared, followed shortly by *The Earthly Paradise,* in which Morris reaches his height as a storyteller. The framework is a story of travelers voyaging in search of an earthly paradise. Two tales, one classical, one medieval, are given for each month of the year. *The Story of Sigurd and the Fall of the Niblungs* is regarded by some critics as the greatest epic poem of the nineteenth cen-

tury. Other poetical writings are *The Aeneid of Virgil Done into English Verse* and *The Odyssey of Homer Done into English Verse.*

In 1863 Morris began the manufacture of stained glass, wallpaper, and artistic furniture from his own designs. This work he continued for many years. In this connection were published *The Decorative Art, Hopes and Fears for Art, Signs of Change,* and *Architecture, Industry, and Wealth.* The influence of Morris' ideas has had a marked effect on household decoration, tending to simplicity, and to the beauty of artistic lines and harmonious coloring. He taught that, to be useful, a thing need not be ugly. And his oft quoted statement, "I would have nothing in my home that I do not know to be useful or believe to be ornamental," has helped many a housekeeper to lighten her labors while she made her home more beautiful thereby. The Morris chair, combining comfort and beauty, was designed by William Morris, and the popularity of straight lines in household furniture is due probably to his influence.

In 1890 Morris established the Kelmscott Press at Hammersmith, where he published artistic editions of Chaucer, Beowulf, and others, including editions of his own works. In 1885 he began lecturing to workingmen. His views were intensely democratic. He helped to support the *Commonwealth,* a socialistic journal. His theories may seem inconsistent with the fact that his own artistic work sold at prices which put it beyond the reach of the majority; but there is no doubt of his sincerity, and that it was the utter lack of beauty in common life that led to his socialistic views.

During his later years Morris published a series of romances in prose and verse, *The Tale of the House of the Wolfings, The Story of the Glittering Plain, The Wood Beyond the World, The Well at the World's End,* and others. He also produced several volumes in collaboration with Magnusson, the Icelandic scholar. Two of these are *The Story of Grettir the Strong* and *Volsunga Saga.*

Morris Plan Banks, a new idea in banking inaugurated in the United States, by Arthur J. Morris, of Norfolk, Va., which is growing in favor, and which meets the needs of the small borrower. Before this plan came into existence it was impossible for this class of people to obtain small sums of money to meet their needs, without coming into the clutches of the "loan shark." Before the World War Germany and Italy had a large number of these banks.

The great banks of France will lend very small sums. But in the United States, until Morris evolved his idea and founded the first bank in 1900, there were no such facilities for small loans. The plan grew but slowly in the beginning, but has rapidly spread until now large numbers of these banks are in operation.

The typical borrower is a man of small salary, say $100 a month. He is in need of some ready money for an emergency, or perhaps some unforseen contingency has come up in his affairs. He borrows $100, usually, paying back the loan at the rate of $2 a week, with bank interest. He gives a note, endorsed by two men in his own class, who are notified in case of default in weekly payments. It is stated that the loss to the bank is but trifling, and any payment by the endorsers is of rare occurrence. Among the officers of these banks are men of high financial standing.

Morristown, N. J., the county seat of Morris County, is situated on the Whippany River and on two railroads, 22 miles west of Newark. Morristown is in a region that is beautiful and fertile, being productive especially of roses and peaches. Fruit and flower cultivation is practically the only industry. This city was settled in 1709-1710 under the name of West Hanover. It was twice the headquarters of General Washington during the Revolutionary War. It was here that Morse and his associate Vail experimented with the electric telegraph from 1873 to 1843. Washington erected here Fort Nonsense, the site of which is now marked by a monument. The shaft of the first steamboat to cross the Atlantic, the *Savannah,* was made here at the old Speedwell Iron works. The city has fine public and parish schools, a public library and several parks. In 1920 the population was 12,548.

Mors, in Roman mythology, the god of death. He was a son of Nox, night, and twin brother of Somnus, sleep. Another account makes him the son of Tellus, the earth, and Tartarus, and states that it was his duty to introduce at some time every human being to his parents.

Morse, Samuel Finley Breese (1791-1872), an American inventor. He was a native of Charleston, Massachusetts. He was graduated at Yale in 1810. It was his ambition to become a painter. He studied with Washington Allston in England. On his return, he became a professor in the University of the City of New York. He became much interested in electricity and in the possibilities of telegraphy. In 1835 he exhibited a recording instrument. In 1837 he filed an application for a patent. In the following years he requested Congress to make him a special grant for the construction of an experimental line from Washington to Baltimore. In the meantime he visited England and was refused a patent for his harebrained scheme. He struggled with a committee of Congress for four years and gave up in discouragement. In the closing minutes of the session of March 4, 1843, however, Congress placed $30,000 at his disposal. In 1844 he completed the construction of his line. The first message over the wire was sent from the United States Supreme Court room in the Capitol at Washington to Baltimore, May 24, 1844. It was, "What God hath wrought." During his experimenting Morse laid a submarine cable, the first, it is believed, in the world, in New York Harbor. The success of Morse's invention created the greatest excitement. Lines were constructed everywhere. As he had no patents to protect him in Europe, the various governments made him a present of $50,000. The sultan of Turkey sent him a decoration of diamonds. Gold medals were sent him by the sovereigns of Prussia and Austria. The king of Denmark sent him a knight's cross. Yale College made him a Doctor of Laws. He derived no wealth from his patents. The money received as presents and otherwise was spent in useless lawsuits in defense of his rights. A bronze statue in Central Park, New York, was erected by subscriptions from telegraph operators. See TELEGRAPHY.

Mortality Statistics. The United States Bureau of Census publishes valuable mortality statistics. The large cities of the union and some of the states, as a whole, keep a register of deaths and causes. The states and cities making such a registry are known as the registration area. These statistics cover this so-called registration area from which returns are available. Death rate is to be interpreted as meaning so many deaths out of 1,000 people. The following are the statistics for 1920:

Population of registered area.....	63,659,441
General death rate	13.1
Deaths from all causes.....	1,142,558
Deaths from:	
Typhoid fever	6,805
Malaria	3,136
Measles	7,712
Scarlet fever	4,004
Whooping cough	10,968
Diphtheria and croup.....	13,395
Influenza	62,097
Tuberculosis of the lungs.....	88,195
Tuberculosis meningitis	4,895
Other forms of tuberculosis...	6,826
Rheumatism	4,287
Cancer and other malignant tumors	72,931
Diabetes	14,062
Meningitis	5,281
Cerebral hemorrhage & softening	71,618
Organic disease of the heart..	124,143
Bronchitis	11,609
Pneumonia (all forms)	120,108
Other diseases, respiratory system.	10,120
Diarrhea and enteritis (under 2 years)	38,514
Appendicitis and typhlitis....	11,702
Hernia, intestinal obstruction.	9,314
Cirrhosis of the liver.....	6,241
Acute nephritis and Bright's disease	78,192
Puerperal septicemia	5,800
Other puerperal causes.....	10,976
Congenital debility and malformation	61,080
Violent deaths (suicide excepted)	68,697
Suicide	8,959
Unknown or ill-defined diseases	15,505
All other causes.....	185,386

Mortar. See LIME.

Mortar d'Arthur, môrt där'ther, **or Morte Arthure,** an English prose romance of the fifteenth century. It was the work of Sir Thomas Malory, and consists of

translations from the French romances of the life and death of the British King Arthur. Little is known of Malory. He is believed to have been a Welshman and to have lived from 1430 to 1470. Caxton, who printed Malory's book, says of him that he was "a servant of Jesus both by day and night," which has led to the supposition that he was a priest. The title "Sir" is an added argument in favor of this view, as priests were accorded the title frequently at that period. Malory's book was called originally the *History of Arthur*. It was printed by Caxton in 1485, only eleven years after the printing of the first English book. The popularity of the Arthurian legends may be judged by the fact that this was eight years before any part of the English Bible was printed. *Morte d' Arthur* was one of the chief sources used by Tennyson for his *Idylls of the King, The Defense of Guinevere* by William Morris, *The Death of Tristram* by Matthew Arnold, *Tristram of Lyonesse* by Algernon Charles Swinburne, *The Vision of Sir Launfal* by Lowell,—all show that their authors were influenced by Malory. *Morte d' Arthur* is still one of the most important books for the student of British legends. Of course, as printed in the original, it is rather difficult reading. Later editions present the text in readable form, while still preserving Malory's quaint style. The extract is from the account of Sir Lancelot's death:

"Ah, Sir Lancelot, there thou liest; thou wert never matched of none earthly knight's hands. And thou wert the courtliest knight that ever bare shield; and thou wert the truest friend to thy lover that ever bestrode horse; and thou wert the truest lover, of a sinful man, that ever loved woman; and thou wert the kindest man that ever stroke with sword; and thou wert the goodliest person that ever came among press of knights; and thou wert the meekest man and the gentlest that ever eat in hall among ladies; and thou wert the sternest knight to thy mortal foe that ever put spear in rest."

See IDYLLS OF THE KING; ARTHUR; CAXTON.

Mortgage, môr'gāj, a sale of property to secure the payment of a debt. It is coupled with the express provision that, if the debt be paid, the sale is not in force. A mortgage may convey personal property or real estate, that is to say, either movables or land. In either case the mortgagee, or person to whom the mortgage is given, is required by law to sign a release, or discharge, in case the mortgage is paid. In case of non-payment he is required to give usually a year's notice, and to advertise before the property becomes his by mortgage sale. A mortgage differs from pawning or pledging in that the property stays in the hands of the one who signs the mortgage until the debt is overdue and the mortgage foreclosed. One of the most common forms of mortgage is one given on a farm or a house in part payment of the purchase price, or to enable the owner to make improvements.

Mortgages are a favorite form of investment in this country and are the resort of borrowers in great numbers. The taxation of mortgages is a vexed question. The mortgager is required to pay taxes on the property mortgaged; but the mortgagee, whose interest may be much the greater, has many ways of escaping. A common method of evading taxation is to have the mortgage run in the name of some person not resident in the state. The only feasible method of taxing mortgages is that of requiring them to be recorded in order to be valid and then of exacting a recording fee. Lawmakers, too, are afraid of driving out money and of raising the rate of interest by a high rate of taxation. New York charges a recording fee of one-half of one per cent per annum. Minnesota charges a flat recording fee of one-half of one per cent. The tax on $5,000 drawn for three years is therefore $75 in New York and $25 in Minnesota.

Morton, Julius Stirling (1832-1902), an American journalist and political leader who was an ardent nature lover and established Arbor Day. He was born at Adams, N. Y., and was graduated from Union College in 1854. In 1855 Mr. Morton moved to Nebraska, where he founded and edited the Nebraska City *News,* the first newspaper in the state. In 1856 and 1857 he was elected to the Nebraska Territorial Legislature, and was appointed Secretary of the Territory in 1858. For a few months he acted as territorial governor. He ran as

Democratic candidate for governor in 1866 and 1881, but was defeated each time. Mr. Morton was Secretary of Agriculture in President Cleveland's cabinet during 1893-97. Upon the advent of W. J. Bryan in Nebraska politics, Mr. Morton became one of his strongest opponents. At his suggestion, Nebraska in 1874 designated a day for tree planting throughout the state, thus establishing our Arbor Day. In 1901 President McKinley appointed Mr. Morton United States Commissioner for the Louisiana Purchase Exposition. He was president of many agricultural societies, and edited a paper, the *Conservative,* at the time of his death, in which he opposed many of Bryan's doctrines, as set forth in *The Commoner.* He also wrote an illustrated *History of Nebraska,* which was published in 1905.

Morton, Levi Parsons (1824-1920), an American banker and statesman, Vice-President of the United States from 1889 to 1893. He was born at Shoreham, Vt., and educated at Shoreham Academy. Removing to Boston in 1850, Mr. Morton became identified with the mercantile firm of Beebe, Morgan and Company. In 1863 he removed to New York City and founded the banking house of Levi Morton and Company, which subsequently became Morton, Bliss and Company, one of the most successful private banking establishments in the United States. In 1878 Mr. Morton was elected to Congress as a Republican, was reelected in 1880, and was United States Minister to France from 1881 to 1885. He was elected Vice-President of the United States on the ticket with Benjamin Harrison, and in 1895-96 was governor of New York. After retiring to private life, Mr. Morton continued his banking business and also became interested in several large insurance companies.

Morton, Oliver Perry (1823-1877), an American political leader who is best known as the war governor of Indiana. Born at Salisbury, Ind., he studied law, and was admitted to the bar in 1847. He soon became prominent as an attorney, and was elected circuit judge in 1852. Mr. Morton entered politics as a Democrat, but opposition to the Kansas-Nebraska Bill forced him out of the party. He became a Republican and was the first Republican candidate for the governorship of Indiana. He was defeated. In 1860, however, he was elected lieutenant-governor, succeeding to the governorship in 1861. In 1864 he was reelected. In 1867 Mr. Morton was elected to the United States Senate, where he became known as an indefatigable worker and the avowed leader of the Republicans. In 1877 he served on the electoral commission that decided the contest between Hayes and Tilden for the Presidency.

Morton, William Thomas Green (1819-1868), an American dentist who was the first man to recognize the anaesthetic properties of ether. He was born at Charlton, Mass., and in 1840 began the study of dentistry at the Baltimore College of Dental Surgery. He was later attracted to medicine, and studied for a time at Harvard Medical School. Dr. Morton devised many improvements in dental surgery, and introduced painless methods into his professional work. He made his first notable operation with ether as an anaesthetic in 1846. He made known the results of his experiments, conducted with infinitely difficult labor, only to have a rival dentist, Dr. C. T. Jackson, claim a share in the honor of discovery. Becauuse of this the Montyon prize of the French Academy was equally divided between the two. Dr. Morton refused his share. Congress offered him $100,000 for his patent. He refused to sell, and for the remainder of his life was involved in suits with the government and with individuals.

Mosaic, mō-zā′ĭk, a surface decorated by the fitting together of small bits of marble, gems, colored glass, or other substances, so as to form patterns. Mosaic is a Greek word meaning a small stone. The mosaics of the ancients rivaled paintings in refinement and delicacy. The earliest known specimens are small patterns appearing on jewelry, ivory fans, and similar articles. The Louvre and the British Museum possess some very fine mosaics from Nineveh and Egypt. Patterns of the lotus and the papyrus plant are inlaid in ivory with small bits of glass, lapis lazuli, and other gems. One exquisite bit of Egyptian

work now in the British Museum is about three-eighths of an inch square. It was evidently a part of a ring. It is ornamented with the sacred hawk. Every feather on the bird's wing is produced in varying colors and tints by a number of stones so small that the use of a magnifying glass is required to tell them apart.

The Greeks and Romans were famous for mosaic pavements. Walls of buildings in Pompeii were faced with thin sheets and bits of marble, having the effect of paintings. Not infrequently the faces of statues were executed in mosaic. The Romans carried their mosaic work into England, in fact, into all parts of the Roman Empire. Much of the best work was done by Greek slaves in Roman employ. Mosaic work was used in the adornment of the early Christian churches. The artist from whom Michelangelo learned to paint was a master of mosaic, or marquetry, as it is sometimes called. An artist of that day boasted that he was able to produce 15,000 varieties of tints in mosaic work. A portrait of Pope Paul V contained 1,700,000 bits of glass, the largest no larger than a millet seed.

It was the boast of the Italian masters of mosaic that they could imitate the finest paintings. To heighten the effects of their work they used gold and silver foil as a basis on which to build. They were able to imitate the transparency of the sky and water, to make a difference between the beard and hair of man, the fur and feathers of animals. They were able to form surfaces that had all the appearance of silk or woolen stuffs, and that, too, in any shade or color. The expression of faces, attitudes, spirited action, the charms of coloring; in short, everything possible to the artist in oils, seems to have been within the reach of the master of mosaic work. If the reader wonders how the workers in mosaic attained such power, it should be remembered that they were people of natural artistic ability, that they were intensely religious, and that they devoted themselves to their art from the earliest childhood. The time that young people nowadays spend in attending school they spent in working with their masters. See POMPEII.

Mosby, John Singleton (1833-1916), an American soldier. He was a native of Virginia, and received his education at the university of that state. When the Civil War broke out he gave up his practice of law at Bristol, Virginia, and enlisted at once in the Confederate Army, acting as scout to General Stuart whose cavalry he guided in its raid on McClellan's army in 1862. Soon after Mosby organized an independent body of horsemen who proved very annoying to the Federal Army. Through Virginia and Maryland Mosby's "Partisan Rangers," as they were called, carried on a kind of guerilla warfare, capturing outposts, destroying supplies and cutting off means of communication. If hard pressed they would scatter to meet at some point previously agreed upon. Their most brilliant exploit was the capture in 1863 of Brigadier General Stoughton at Fairfax Courthouse. Later they were pressed into the regular Confederate Army, where Mosby rose to the rank of colonel. At the close of the war Mosby resumed his law practice. He became a Republican, and supported Grant for the presidency. He was United States Consul to Hong Kong from 1878 to 1885. From 1904 to 1910 he was assistant attorney in the Department of Justice at Washington. Mosby is the author of *War Reminiscences*

Moscow, the capital of Soviet Russia, is the principal city of the province of the same name, and the first city in the country. It is situated on the Moskva River, 400 miles southeast of Petrograd (formerly St. Petersburg). Moscow was the second capital of the Russian Empire and was succeeded by Petrograd; after the Bolshevist coup of 1917 it was made the capital of the new republic.

The city is irregular in plan. The Kremlin, situated on the north bank of the Moskva, was the core of early Moscow, but in modern times the city has grown around it eccentrically. The streets display no uniformity; some are broad and others narrow; some straight and others tortuous. The architecture of the city was once distinctively Russian, but the introduction of western civilization gave rise to architec-

tural innovations in all buildings except churches. These retain their typically Russian aspect.

The Kremlin was for many years the seat of Russian political and religious life. In its early days it contained the palace of the czar and the palaces of the nobility, as well as the principal churches and monasteries. East of the Kremlin the first commercial quarter grew up. Many of the churches, monasteries and palaces had disappeared even before the revolution.

Near the Kremlin is the Red Square. This was many times used as a camp site by Mongol besiegers; as a forum for Russia's monarchs; and as the execution ground for criminals. Facing the Red Square is the Cathedral of Vasili the Beautiful, built by Ivan the Terrible, in 1554. Many other churches, and squares containing monuments to celebrities of the old regime, are to be seen in the vicinity of the Kremlin.

But the Kremlin, dominating the city from its position on a low hill, and the structures surrounding it, are not the only interesting sights of the city. There are numerous large, wooded parks in or near Moscow, and numerous educational institutions, museums, libraries and theaters. The Palace, which was occupied by Napoleon in 1812, is a notable structure, as are the Church of the Savior and the Pokrovsky Cathedral.

Moscow is the chief industrial and commercial city of Russia. Before the rise of the Bolshevists there were at least 200 textile mills in Moscow, but accurate figures on this and other industries are not now available. There are also numerous factories for the manufacture of paper, boots and shoes, wooden ware, metal products, leather, machinery and foodstuffs. Since early in the fourteenth century this city has been a commercial center of the first importance. Six lines of railroad, connecting Moscow with every part of Russia in Europe as well as with Siberia, converge here. Since an early day there has also been an extensive trade by water. The agricultural produce of the southern provinces, tea, spices and cloth from Asia, minerals from the north, fish, indigo and raw silk, are sent to Moscow for manufacture or reshipment or both. The trade from Asia is especially important, for Moscow is, for the East, the door to Europe.

In 1871 Moscow had 602.000 inhabitants. The city grew very rapidly, however, and in forty years the population had increased to 1,635,000. When, after the World War, conditions permitted the taking of another census, it was found that its inhabitants numbered (1920) only 1,050,011. See RUSSIA.

Moseley, Edward Augustus (1846-1911), an American economist and the first secretary of the Interstate Commerce Commission. He made a profound study of the railroad problem in the United States, and wrote many pamphlets on the subject. His birth-place was Newburyport, Mass. In his early youth he made several voyages on vessels engaged in East Indian trade, after which he engaged in legal studies, was admitted to practice before the Supreme Court of the United States, and was for several years in the Massachusetts legislature.

In 1887, the Interstate Commerce Law was passed, through Moseley's efforts to a large degree. As secretary of the Commission he did some very creditable work. He drafted many of the railroad laws of Cuba at the time when the United States occupied it, and improved transportation on the island.

Moselle, a tributary of the Rhine, rises on the west slope of the Vosges Mountains in the northeast corner of France, flows northwestward to the French boundary, then northward past Metz, and then turns to the northeast with many windings through the Prussian Rhine Province. Throughout most of its length, the river flows through a narrow fertile valley enclosed by steep hills and mountains. It is from the lower valleys that the famous Moselle grapes are picked. The grapes from these vines make very fine wine, noted for its aromatic flavor.

The valley is also interesting historically because of the many ruins and landmarks. The Moselle has a total length of 314 miles, navigable downward from Frouard. There is a canal extending from Metz to the frontier.

Mosenthal, Joseph (1834-96), an American musician of German descent, was born at Cassel, Germany. For twenty-seven years he played the organ in Calvary Church, New York. He was also conductor of the Mendelssohn Glee Club for thirty years, and played the violin very expertly. He composed many noteworthy pieces of music, including *Thanatopsis, The Music of the Sea* and *Blest Pair of Sirens*. His work in the Philharmonic Orchestra and with the Mason and Thomas quartette won him praise and admiration.

Moses, a Hebrew leader and lawgiver, the most prominent figure in early Old Testament history. His story begins in the book of Exodus where the life of the Israelites in Egypt was made "bitter with hard bondage." Pharaoh, fearing that the Israelites were growing in power as they grew in numbers, ordered all the boy babies to be killed, but a "goodly child" being born to a Levite family, his mother hid him for three months. When she could no longer conceal him she placed him in an ark of bulrushes, "in the flags by the river's brink," hoping that he would be found, and knowing that no woman, at least, could resist her beautiful baby. The little sister was stationed "afar off" to watch. The mother's hopes were fulfilled; an Egyptian woman—none other than the daughter of Pharaoh—came down to bathe, found the baby, loved him, and decided to keep him. Through the quick-wittedness of the sister his own mother was employed to nurse him. His foster mother gave him the name of Moses, signifying *Drawn out,* because she drew him out of the water. Josephus, the Jewish historian, tells us that Pharaoh's daughter at once took the little fellow to her father, telling him that as she had no child of her own she wished to keep this boy, and hoped that he might some day inherit the throne. Pharaoh was pleased and took the child in his arms. Playfully he set his crown on the little one's head but Moses threw it to the ground and, springing from the monarch's knee, stamped upon it. This was looked upon as an ill omen and Pharaoh was urged to have the boy put to death, but God turned his mind from such a purpose.

We are told in the New Testament that Moses received a good education, and it is probable that Pharaoh's daughter did plan that he should become heir to the throne. As Moses grew up, however, he learned the truth as to his parentage, and began to observe the oppression of his people. Finally he impulsively slew an Egyptian overseer who was mistreating a Hebrew. This was the turning point in his career; by this act he cast in his lot with his own people rather than with the Egyptians. On Pharaoh's hearing of his deed, Moses fled into Midian where he remained forty years as a shepherd of the flock of Jethro, the high priest of the Midianites, whose daughter he married.

At this time the oppression of the Hebrews under a new Pharaoh was becoming more grievous, and God speaking from the burning bush on Mount Horeb summoned Moses to become the liberator of Israel. Moses hesitated and argued his unfitness for the task. "The people will not believe me nor hearken unto my voice" he pleaded. Then God gave him "two signs" with which to convince the people that he was divinely sent. One was the power to change his rod into a serpent at will, the other to turn his hand white with leprosy, and restore it again "as his other flesh." Still Moses demurred because he was not eloquent, but a man "slow of speech and of a slow tongue." Then God in indignation at his lack of faith, declared that Aaron, the brother of Moses, should be the spokesman, speaking the words given him by Moses from God. Together then Moses and Aaron undertook their appointed task. The appeal to Pharaoh, the plagues of Egypt, the final escape from Pharaoh and the subsequent forty years of wandering in the wilderness guided by the pillar by day and the fire by night, are too well known to need repetition. In the third month following their departure from Egypt, when the Israelites had come to Mount Sinai, God gave Moses the ten commandments which were to be the basis of the Israelitish law.

Moses himself never entered Canaan, but from Mount Pisgah God allowed him to look upon the Promised Land. There he died, and God "buried him in a valley in the land of Moab, but no man knoweth of

his sepulcher unto this day." Moses had forty years of mental training at the court of Egypt, forty years on the Midian plains, where, with Nature as a teacher, both body and spirit were made ready for his great work. Then for forty years he displayed the greatest moral and physical courage, the most remarkable power over man, the wisest and most far-sighted policy as a statesman, the highest conception of the Deity—all the qualities that go to make a leader of men, and with these qualities the profoundest love of righteousness, the most utter forgetfulness of self.

It was long believed that Moses wrote the five books of the Pentateuch. Modern scholars agree that they were the work of several authors, and were collected at a much later date than the time of Moses. However that may be, or however one may question the details of the narrative, the story of this liberator and leader is, in the main, historical, and all agree that he is one of the most august characters of antiquity. The story of his death and burial, Mrs. Cecil Frances Alexander, an Irish poet, has told in a poem which will never cease to be a favorite.

This was the truest warrior
  That ever buckled sword,—
This the most gifted poet
  That ever breathed a word;
And never earth's philosopher
  Traced with his golden pen,
On the deathless page, truths half so sage
  As he wrote down for men.

And had he not high honor—
  The hill-side for a pall,—
To lie in state while angels wait,
  With stars for tapers tall,—
And the dark rock-pines, like tossing plumes,
  Over his bier to wave,
And God's own hand in that lonely land,
  To lay him in the grave?

See PENTATEUCH; DECALOGUE.

Mosque, mŏsk, a Mohammedan house of prayer. As the Mohammedan form of worship is simple it requires but a simple building for its observance. There are three requisites: an opportunity to wash, to kneel quietly in prayer, and a pulpit for the exhorter or reader of the Koran. Some mosques are extensive buildings erected for other purposes. Others are cramped in size by the shape of the bit of land available for the purpose. The typical mosque, however, has the same form from Morocco to the Malay peninsula. The exterior is rectangular in outline. The interior consists essentially of a central open court, surrounded by a covered cloister or walk, the roof of which is supported on pillars. The central court is covered only by a dome. In the center of the court is a tank for performing the ablutions requisite before engaging in prayer. Some sects require a fountain of running water, others are content with quiet water. The end of the building, which is toward Mecca, is screened off to form a prayer room, and is furnished with what we should call a pulpit for the readers of the Koran. The entire building is without pictures, images, altars, shrines, or seats. Women are expected to pray at home. Sometimes a special compartment is provided for them, but they do not worship with the men. Ordinarily, a minaret or tower erected at one corner is provided with a high balcony from which the muezzin calls to prayer. The use of a bell is not permitted. Many of the mosques are richly decorated with carving, gilding, mosaic, and tile work of indescribable richness. No material is too rich to be lavished on the interior work. There are pavements of the finest marble. Glass, mother of pearl, agate, and other costly stones are laid in mosaic work. The pulpit is covered not infrequently with delicate ivory carvings, or inlaid with pearl and ebony. The windows are composed frequently of bits of pearl-colored glass set in a mosaic. They flash like panes of precious jewels. Even the pillars are veneered not infrequently with rich materials set in mosaic. Some of the most noted mosques of the type described are at Cordova, Cairo, Fez, Damascus, and Delhi. Like Christian churches, the mosque sometimes serves also as a mausoleum. The famous Taj Mahal at Agra, India, is a mosque of this sort. The noted mosque of St. Sophia at Constantinople is an ancient Christian basilica. Constantinople has from 350 to 500 mosques, chapels included. Cairo is credited with an equal number. See TAJ MAHAL.

Mosquito, mŏs-kē'tō, a family of annoying insects allied to the fly. The name is Spanish, meaning a little fly. The body

is slender, the legs are long, the wings are narrow and fringed with hair. The mouth parts are protruded into a firm, slender, overly-long bill or proboscis. So far as observed, mosquitoes breed in water, yet it is believed they also breed in moist earth. The female lays long, slender eggs on the surface of the water. The larvae on hatching descend into the water. They are called "wigglers." As seen in a rain barrel the wiggler hangs head downward with the tail at the surface breathing through a tube rising from the last segment (joint) but one of the abdomen. In the third or pupa state, contrary to the usual custom of insects, the mosquito is active and can be told from the wiggler most readily by its large head and club-shaped body. When the pupa is full grown it waits for a quiet moment, floats on the surface of the water, splits its skin from end to end and, standing on the old skin like a raft—a critical moment, for a breath of air would upset the craft—unfolds its wings, allows them to harden for a moment, and takes flight.

Dr. Lugger, of Minnesota, found 17,259 eggs and wigglers in one barrel of rainwater and 19,110 in another. From ten to thirty-seven days are required to hatch the egg and develop the full grown mosquito, according to species. Ordinarily, the adult lives from eight to twelve days. Certain females with eggs lie dormant over winter. Late wigglers caught in the ice thaw out in the spring and complete their growth.

The wigglers glean decaying vegetable matter from stagnant water, and in this way perhaps they do some good as scavengers. The male adults content themselves with similar food,—some think they search flowers for nectar. The females with eggs to lay are ravenous for blood. The floor of the mouth and the upper lip are extended enormously in the shape of a long, firm tube with which the female penetrates the skin of man and beast. Having gorged herself with blood pumped up through this tube, the insect injects a drop of poisonous saliva before withdrawing her bill. It is this poison, not the puncture, that causes the painful swelling known as a mosquito bite.

Smoke of any kind annoys mosquitoes. Smudges of dry wood or hay at the center, smothered with slow burning green weeds, foliage, or wet chips, are the most efficient. Oil of pennyroyal rubbed on the exposed parts of the body does some good. Extensive experiments are being carried on by way of flooding swamps with a film of kerosene to prevent the breeding of wigglers. When the wiggler rises to breathe the slightest amount of oil touching the tube causes death. It now seems well established that a certain mosquito communicates the germs of malarial fever. Another causes yellow fever. It is some comfort to know that mosquitoes diminish in numbers as a country is opened up to cultivation.

There are many species. Seventeen kinds have been identified in Minnesota. Mosquitoes are found the world over. They rise in swarms during the short arctic summer. They infest the tropics. They annoy the climber 13,000 feet up the Himalaya Mountains.

See MALARIA; YELLOW FEVER.

If quite protected against infant mortality and untoward accidents, a single pair of mosquitoes not only can, but inevitably will, become the ancestors of 10,000,000,000 descendants during the waxing and waning of two summer moons. Mother mosquito lays 400 eggs at a time. They float in clusters like tiny rafts along the edges of stagnant ponds. In a couple of days the eggs hatch, and out of each swims a small wiggler. It takes about five days for the wiggler to feel the need of a change. Then he sheds his skull and his face and a few other portions of his anatomy, folds what is left up into a tight little bundle, and waits three days longer before floating up to the top of the water and taking to the air as a full fledged adult. And then, within forty-eight hours, each of the new-hatched females will do her duty in the egg-laying line. Once the first brood of 400 is at work it would take the experts of the Steel Trust to figure out the increase for thirty days.

Fortunately for man, in his effort to extirpate the race, a great many of the egg-boats are destroyed before hatching. Then the small wigglers have the pleasing habit of biting off pieces of their sisters and brothers; and many a pupa, aspiring to flight, has been caught by a ripple on the surface of the water and drowned before it could shake out its filmy wings; which is why mosquitoes are found near small and stagnant ponds or puddles and never in the vicinity of running streams or bodies of water exposed to the violence of the wind. Wigglers by the million are also eaten by small fish and by dragon flies, though the latter are too fond of basking idly in the sun to live up to their possibilities in the devouring line and be real aids in the business of extermination.—Henry M. Hyde in *Technical World.*

Mosses, lowly green flowerless plants often carpeting the ground or upholstering old logs. They have no true roots. Mosses may be known by tiny spore cases rising like street lamps from the tip of a leafy stem. The spore case or capsule is covered with a thin lid which flies off at maturity, leaving a fringe-guarded orifice, from which the spores escape. The gray sphagnum, a water-holding moss of evergreen swamps is much used by nurserymen for packing the roots of plants in shipment. Club mosses are ground pine, which see, and the "mosses" on trees are very likely lichens. Spanish moss is not a true moss, but a flowering epiphyte. Mosses grow in a great variety of situations. They play an important part in the world. Mosses are among the earliest forms of vegetation to take possession of newly formed soil, and are able to exist where grasses are impossible. They form a rich soil and pave the way for higher plants. Bog-moss or sphagnum forms the great peat beds of both continents. They serve an important end in the control of floods. A bed of moss retains water like a sponge and serves to retard the formation of torrents. There are about 5,000 species of mosses.

Moth, a common name for numerous families of insects closely related to the butterfly. The general nature of a moth may be learned from the articles on INSECTS and BUTTERFLIES. The moths may be known from the butterflies in a general way by remembering that moths fly usually at night; allow their wings to remain open while resting; have pointed, not knobbed, feelers; and that the pupa often incloses itself in a spun cocoon. As a rule, moths are more hairy or woolly than butterflies, and, as they fly at night, do not wear as brilliant raiment.

There are over 6,000 species of moths and butterflies in North America outside of Mexico. It is difficult to find appropriate common names for so many moths. One with a floury coat is called the miller. Certain large moths are called hawk moths from their strong flight. A moth of this family is also called a hummingbird moth from a habit of hovering over a flower while sucking the nectar through its long tube. Some moths are named from the plants their larvae feed on; some are named from their habit of flight, the shape of their wings, or the clothing they wear. Skippers have a darting motion; swifts are noted for rapidity of flight. Flannel moths are clothed in curly wool. The caterpillar of the bag-worm moth builds itself a silken sack and hides it by gluing on bits of twigs. The larva of the carpenter moth bores into the twigs of the locust tree. Smoky moths are black. Bee moths lay their eggs in beehives. The meal moth leaves its eggs in any sort of meal or flour. The close-wing wraps its wings about it tightly and hides on a blade of grass. The pine-pest infests pine trees. The flour moth is a pest in flouring mills. The wings of the plume moth are separated by fissures into feather-like plumes. The codlin moth is one of the worst enemies of the apple grower. Its caterpillar ruins the young apple. The ugly-nest caterpillar fastens a wad of oak or cherry leaves together. The caterpillars of well on to 1,000 kinds of small moths live by mining a channel each in the kind of leaf—clover, oak, apple, palmetto, pine, maple, cherry—it likes best. The clothes moths, three kinds of them, lay their eggs in clothing and furs. The larvae cut their way regardless of value, and when they have eaten they cut more to make pockets or cases to live in. The only safety from clothes moths lies in keeping the moths out. Clearwings have transparent wings, unusual for a moth. Borers, and there are many species, infest fruit trees, currant bushes, and melon patches; their caterpillars bore into twigs and vines, following the pith and doing millions of dollars' worth of damage annually. "Prominents," "handmaids," and "mocha-stones," have their peculiarities.

Caterpillar or measuring worm geometrids draw tail to head, humping up the back. They seize the twig by the rear legs, raise up the head, and, reaching forward full length, seize hold by the front legs. The rear end is thus drawn up a second time, and thus they measure along until they find food to suit. The black-witch is a magnificent night moth. The boll-worm, the army-worm, the cut-worm, the canker-worm, and the cotton-worm are caterpillars of various moths. Tussock, wood-nymph,

forester, tiger-moth, web-worm, tent caterpillar, yellow-bear, footman, window-winged, sphynx, tobacco-worm, hog-caterpillar, silkworm, royal, regal, imperial, oak-worm, and luna are some of the suggestive terms used in naming either moths or their progeny. And thousands of moths have not yet been described or named by entomologists.

As to size moths vary greatly. The distance across the outspread wings may be a fraction of an inch or, as in the case of the owl moth of Brazil, the breadth of wing spread may measure eleven inches.

The United States Department of Agriculture has ably served the American agriculturist, horticulturist and fruit grower in studying the ravages of insects and devising means for the extermination of many kinds of beetles, flies, locusts and moths. One moth—the well known gypsy moth,—brought to the United States from Europe in 1868, became so destructive of fruit and shade trees in Massachusetts that the state made a substantial appropriation for its extermination. The "worm" or larva is a greater scourge than the adult insect. See COTTON; CUTWORM; ARMY-WORM; SPRAYING; SILK.

Mother Carey's Chicken, a familiar name given by sailors to the storm petrel. It is a gull-like bird that scuds along the surface of the sea, patting the water with its feet, apparently running, now down into a trough, now up on a crest. In stormy weather, when the waves are tossing, it may be seen busily searching for the small shell-fish and other marine animals on which it feeds. It is the smallest web-footed bird known, being less than six inches in length, It is black with a white patch over the rump. It breeds on rocky shores. It lives habitually farther out at sea than any other bird seen in a transatlantic voyage.

Mother Goose, a name long celebrated in the lore of the nursery through the rhymes and jingles known familiarly as *Mother Goose's Melodies.* The name, "Mother Goose," was first known in English through a translation from the French of Perrault's stories entitled *Tales of Mother Goose.* The French collection of stories was published first in 1697. The name had been in use in France long before, however, and appears in French tales as synonymous with Queen Goosefoot, an appellation of Bertha, mother of Charles the Great, who was called "Bertha with the goose-foot," because one of her feet was larger than the other. The collection of jingles so popular with American children comes probably from a variety of scources. *Mother Goose's Melodies* was published first by Thomas Fleet, a Boston printer, in 1719. About 1860 an attempt was made to account for the use of the name, "Mother Goose," in the title. As Fleet's wife had borne the maiden name of Goose, the story became current that Fleet's book had been named for his mother-in-law, the widow of Isaac Goose, who had annoyed Fleet by singing these ditties continually to his children. Fleet thought to be avenged upon her by using her name for his book of jingles. This tale is probably without foundation. At present many rhymes suitable for very young children are classed as "Mother Goose" melodies, although not found in the original collection.

Mother Hubbard, in nursery lore, the heroine of a famous story in rhyme, beginning,

> Old Mother Hubbard
> Went to the cupboard
> To get her poor dog a bone.

The name Mother Hubbard is taken doubtless from Edmund Spenser's poem, entitled *Mother Hubberd's Tale,* published in *Complaints,* 1591. It is a satirical fable written in the style of Chaucer.

Motley, John Lothrop (1814-1877), an American historian. He was born at Dorchester, Massachusetts, April 15, 1814. He died at Dorchester, England, May 29, 1877. He was educated at Harvard University and at Berlin and Göttingen. Being a young man of independent means, he was able to spend a few years in writing and in waiting for something to turn up. He contributed to the various periodicals, and in 1839 wrote a novel, *Morton's Hope,* which attracted no attention. In 1841 he received an appointment as secretary to the American legation at St. Petersburg. He retained this position but a year. During the time he gathered material for a narrative of *Peter the Great.* It was published

in the *North American* for October, 1845, and marks the beginning of his historical work. He began about this time to collect material for a history of Holland, in the meantime making contributions to the American periodicals. His relations with Prescott, who covered in part the same ground, were amicable. Fortunately he was able to visit the great libraries of Berlin, Dresden, the Hague, and Brussels. In 1856 his *Rise of the Dutch Republic* appeared. It was received with favor by eminent men and scholars on both sides of the Atlantic and established his fame. It was translated into the French and German. Other works of importance were a *History of the United Netherlands,* appearing in 1873, and *The Life and Death of John of Barneveld,* appearing in 1874. Motley's style is vivid. His histories are standard. In addition to his historical work, Motley was a member for a time of the Massachusetts legislature, and during the administration of Grant was minister to Austria.

Motor, any mechanical device by which energy in any form is used to produce motion. Thus there are wind motors and water motors. A tread-mill operated by horse or dog would fall in this class. Steam engines are motors. The term, however, has come to be applied most frequently to those in which the energy is electrical, so that the word motor when used alone means electric motor. As a dynamo is a machine for transforming mechanical energy into electrical, a motor is seen to be the reverse; they are alike in construction and theoretically interchangeable, though each is modified somewhat for its especial purpose. The essential parts are the armature and the field magnet; the current from the outside source produces the field and at the same time induces magnetism in the armature so that it will turn. Space will not permit going into detail as to the working of different kinds of motors.

The widely extended use of electric motors has come about from the ease with which energy may be electrically transmitted. It is much cheaper by wires than by belts or shafting and there is much less loss. Then they can be made in small units as for sewing and washing machines, and vacuum cleaners, as well as for street cars and the running of machines requiring hundreds of horsepower. See DYNAMO.

Motor Cycle. See BICYCLE.

Mott, Mrs. Lucretia Coffin (1793-1880), an American reformer. Lucretia Coffin was born at Nantucket, Massachusetts. In 1809 the family moved to Philadelphia where Miss Coffin married James Mott, both husband and wife becoming advocates of anti-slavery. She belonged to the society of Friends, opened a Friends' School in 1817, and the following year began to preach. In 1833 she was interested and active in organizing the American Anti-Slavery Society, going in 1840 to the London World Convention. At this convention the question arose of the participation of women in the proceedings, on an equal footing with men. After some discussion women were excluded. This occurrence led to the woman's rights movement in which Mrs. Mott became prominent. She and Mrs. Elizabeth Cady Stanton were prime movers in the Woman's Rights Convention held at Seneca Falls in 1848. Mrs. Mott was interested also in the temperance question, and in fact in any and all movements for the uplift of humanity.

Moultrie, William (1731-1805), the famous American Revolutionary soldier who so brilliantly defended Charleston, S. C., in 1776. Born in England, he early removed to South Carolina, and in the Cherokee Indian War of 1761 served as a captain. In 1775 he was the representative of St. Helena Parish in the South Carolina Provincial Congress, and in the same year was promoted colonel of a South Carolina regiment. General Moultrie constructed in 1776 a fort on Sullivan's Island, commanding the Charleston harbor entrance. This fort was vigorously attacked by the British under Admiral Sir Peter Parker, and because of General Moultrie's defense the fort was given his name. Promoted brigadier-general, he again defeated the British at Beaufort in 1779. When Charleston was surrendered in 1780, General Moultrie was taken prisoner, but was later exchanged for General Burgoyne. He was twice elected governor of South Carolina.

Mound-Birds, peculiar jungle-fowls of

Australia. They are about as large as an ordinary barnyard fowl. They have stout legs and large feet. They inhabit the bush and scrub, usually near water, and go in pairs and in flocks. The plumage is dull. Their flight is slow and heavy. The popular name has reference to a habit of heaping up mounds of earth and decaying vegetable matter in which to bury their eggs. These heaps are made usually in the shade of trees to preserve their moisture. They are so large that they were mistaken at first for native burial mounds. The female buries her eggs deep down in the muck, depending, it is claimed, on the heat of fermentation, like that of a hotbed or incubator, to hatch the young. The chicks appear full-feathered, like young partridges, ready to run or fly.

Mound Builders, The, a name given to the earliest known inhabitants of the western continent. They are so named from the thousands of great mounds found throughout the continent, built by them probably as fortifications. These immense structures are of different shapes, some of them circular, others crescent-shaped, etc. Ohio has from ten to twelve thousand Indian mounds. Whether or not the builders were really of the Indian race is a disputed question. One great mound, seventy feet high and nine hundred feet around at the base, was found to contain two vaults, in which were three human skeletons, one decked with ivory beads and a long ivory ornament, another with copper rings and ornaments of bone and mica. In another mound was found the skeleton of a man seven feet tall, the bones lying on a bed of ashes. In Preble County, Ohio, is the famous "serpent" mound, built in the form of a great serpent, and 1,300 feet in length.

Moundsville, W. Va., an industrial city and the county seat of Marshall County, is 11 miles south of Wheeling, on the Ohio River. Transportation is afforded by several lines of steamers and by the Baltimore & Ohio Railroad and it also has trolley connection with Wheeling. Moundsville is the commercial center of a large agricultural and coal mining region, and has factories for the production of glass, enameled ware, bricks, lamps, lumber, flour, foundry products, clothing and leather.

The West Virginia Prison is located here. Besides the prison buildings, the most noteworthy structures are the Reynolds Memorial Hospital, Federal building, court house, three large grade school buildings and a high school building. Near the city is the conical mound, 75 feet high, from which the city takes its name. In 1920 the population was 10,669.

Mountain Ash, a small tree of the pear family. The wood is hard like that of the apple tree. A wealth of white flowers is followed by showy clusters of red berries. The leaves are drooping, pinnate, and of a handsome green. Three species are well known. The American mountain ash is found from Duluth to the Atlantic Ocean. It is hardy and ornamental, and is valued in dooryards. A second species is found in the West. The European mountain ash is known also as the rowan-tree and the quick-beam.

Mountain, George Jehoshaphat (1789-1863), son of Jacob Mountain, was born in England, going to Canada in 1813, where he was ordained priest. He held several pastorates in New Brunswick and Quebec. Through his efforts the dioceses of Rupert's Land and Montreal were established in 1849-50, and he became bishop of Quebec, retaining this position until his death. He was the founder of the Church Society in Canada, and Bishop's College, Lennoxville.

Mountain, Jacob (1750-1825), was born in the County of Norfolk, England, educated at Cambridge University, and later ordained a priest of the Church of England. In 1893 he was made bishop of Quebec, at which time Canada was divided into two provinces: Upper and Lower Canada. Mountain had episcopal charge of both of these provinces. He worked devotedly and became the founder of the Anglican Church in Canada.

Mount Blanc. See BLANC.

Mount Carmel, Pa., an industrial borough, is 71 miles northeast of Harrisburg, on the Lehigh Valley, Philadelphia & Reading and Pennsylvania railroads. The principal industry is coal mining, and

coal is the most important item in Mount Carmel's commerce. In the city are factories for the production of lumber, wagons, cement building blocks, knit goods, silk, hosiery, machine shop, foundry and abattoir products, cigars and miners' caps. Mount Carmel has a modern educational system and numerous churches. In 1920 the inhabitants numbered 17,469.

Mount Clemens, Michigan, a health resort situated on the Clinton River, 20 miles northeast of Detroit. Its location is beautiful, and its mineral springs are noted for their curative properties. There is a Carnegie library here and modern hotels and bathhouses. Mount Clemens has several important industrial plants, among them a beet sugar factory, cooperage works, and factories where agricultural implements, wagons, automobile accessories, pottery, etc., are turned out. The town was settled in 1802, laid out in 1818 by Judge Christian Clemens, and incorporated in 1878. Public utilities are owned and managed by the city. Population in 1920, 9,488.

Mount Desert, the largest of the chain of islands extending along the Maine coast, is separated from the southern mainland by Mount Desert Narrows. The island, dotted with small, clear lakes, and in some parts heavily wooded, is seven miles long and fourteen miles wide. It is mountainous, one peak, Green Mountain, rising 1,550 feet. On the side toward the sea the cliffs are high and bare.

Mount Desert is connected with the mainland by a bridge across the Narrows, and it has steamer connection with all important ports as far south as New York. Rail service is provided by the Maine Central Railroad. The island has three fine harbors—Bar Harbor, Northeast Harbor and Southwest Harbor. The largest settlement on the island is Bar Harbor, which has a permanent population of about 2,000.

Because of its rare beauty and its proximity to the sea combined with accessibility from the large cities of the coast, Mount Desert has for many years been an exclusive summer resort. In 1919, eight square miles of the island were set aside by the government as a park under the name of Lafayette National Park.

Mount McKinley. See ALASKA.

Mount-Stephen, George Stephen, Baron (1829-), a Canadian financier. He was born in Dufftown, Scotland, and after removing to Canada in 1850, he soon became a wealthy merchant in Montreal. He was president of the Bank of Montreal, president of the Manitoba and Minneapolis Railway, and president of the Canadian Pacific Railway. He was knighted in 1886, in recognition of his services for the promotion of the Canadian Pacific Railway. Together with his cousin, Sir Donald Smith, he gave $1,250,000 to the founding of the Royal Victoria Hospital in Montreal, which was completed in 1893. In 1891 he was raised to the peerage as Baron Mount-Stephen.

Mount Vernon, the home and estate of George Washington. It is situated on the Virginia shore of the Potomac, sixteen miles south of Washington. It is reached from Washington by a trolley line; also in the summer season by pleasure steamers plying on the Potomac. The house was built in 1743 by Lawrence Washington. He changed the name of the estate from Hunting Creek to Mount Vernon in honor of a British admiral of that name under whom he had service. On the death of Lawrence and his only child, George Washington inherited the estate. He came to live here shortly after his marriage in 1759.

In 1855 a descendant of Washington, being unable to maintain the estate, offered it for sale. An association of patriotic women was formed to undertake its purchase. Edward Everett Hale assisted them in the undertaking. They raised $200,000. Washington Irving gave $500. The house and 200 acres of land around it were purchased in 1859. An organization was perfected, consisting of a regent and of a vice-regent for each state in the Union.

The several allotments in the cares of the vice regents for the different states are as follows: Alabama, the main hall; California, the wharf; Connecticut, a spare chamber; Delaware, a guest chamber; District of Columbia, a guest chamber; Georgia, Mrs. Washington's sitting-room; Ilinois, a parlor; Kansas, servants' quarters; Louisiana, summer house and piazza;

Maine, a guest chamber; Maryland, Miss Custis' room; Massachusetts, the library; Michigan, the old tomb; Minnesota, an upper chamber; Missouri, the garden wall; New Jersey, Lafayette's room; New York, banquet hall; North Carolina, an upper chamber; Ohio, music room; Pennsylvania, river room; Rhode Island, the sun dial; South Carolina, the family dining-room; Tennessee, a chamber; Virginia, the room in which Washington died; West Virginia, the green room; and Wisconsin, the room in which Mrs. Washington died. The arms of the states are displayed in the respective rooms. The building was repaired carefully and converted into a museum of Washington and colonial relics. Much of the old Washington furniture was still in the mansion. Mementos were collected from every direction.

The hall and various rooms are now hung with medallions and portraits of Washington and other members of the family. Among other relics are three of Washington's swords, Washington's own map of the Mount Vernon estate, his dressing case, holsters, part of his camping equipage, his flute, his card table on which he and Lafayette played whist, his spectacles, champagne glasses, steel camp fork, a lock of his hair, his silver inkstand, a suit of his clothes, a velvet waistcoat, silk stockings, his compass and reading glass, his favorite chair, and the bedstead on which he died. Other family relics are Martha Washington's ivory fan, the harpsichord of Nellie Custis, a guitar and music book belonging to a cousin Fontleroy, and the family china. Nearly all of Washington's books are owned by the Boston Atheneum, but duplicates have been placed in the old bookcase, giving the library much the appearance it must have had in Washington's day. As stated, much of the family furniture has been preserved. Other pieces have been obtained from relatives and friends, creating at Mount Vernon the most complete exhibition of colonial furniture, chairs, tables, bedsteads, sideboards, mirrors and mantels, andirons, bookcases, and cabinets in existence.

A covered colonnade connects the mansion, Virginia fashion, with a series of outbuildings, including two kitchens, storerooms, and coach house. The latter contains the old family coach. There are shaded, well kept lawns in front of the house and a deer park below them. In the rear there are lawns, gardens, and orchards. An old-fashioned sun dial stands in an open place. The flower garden is inclosed with quaint boxwood hedges. There are numerous trees set out by Washington's own hand. An elm was planted in 1876 by Dom Pedro, emperor of Brazil. A young elm, sent by Miss Alice Longfellow, vice regent for Massachusetts, was set out by Mrs. Grover Cleveland. The famous Mary Washington rose, named by Washington for his mother, still blooms. A willow from Napoleon's grave at St. Helena is still flourishing. Washington's tomb is protected by an iron railing. Though visited annually by a hundred thousand people, the grounds show the utmost care. It is pleasing to reflect that Mount Vernon belongs to the nation, and that it is guarded as a sacred heritage.

See WASHINGTON.

Mouse (plural, mice), a widely distributed family of gnawing animals. Mice and rats are related closely. Except the shrews, mice are the smallest quadrupeds known. The house mouse is probably of Asiatic, certainly of Old World, origin. It has followed the white man in all his wanderings, coming to America, we are told, in the ships of the early colonists. Like the rat, it is a famous stowaway, hiding in the boxes of colonists, and especially in the walls of wooden ships. The mouse is too well known to require description. Mice are not only exceedingly destructive but they multiply with great rapidity. A single pair of mice under favorable conditions, will develop into a colony of 100 within a year. Were it not for the vigilance of the house cat, they would soon overrun mills and farms to such an extent that the production of grain, meal, and flour would be impossible. In 1908, 15,000 acres of alfalfa were destroyed by field mice in the Humboldt Valley, Nevada.

Of our wild or native mice, several are of interest. The deer mouse, also called the white-footed mouse, is a delicate, dainty creature with large ears and fine, brilliant eyes. It whisks about at night, laying

away a store of seeds and nuts. It is exceedingly timid and not infrequently dies of fear when taken in the hand. In winter it makes tunnels in every direction under the snow.

The jumping mouse is a shy creature seldom seen. Its fore parts are slight; it has long, powerful hind legs, and a slender tail. When surprised, it endeavors to make its escape by a series of jumps several feet in length, kangaroo fashion, in which, no doubt, it is assisted by its tail. It is not a true mouse.

The meadow mouse is a heavily built creature, rather slow in its movements. Other wild mice are the pine mouse, the long-eared mouse, the harvest mouse, the cotton rat, and the rice-field mouse.

See JERBOA; DORMOUSE; RAT; LEMMING; DEERMOUSE.

Mouse Tower, a watch tower on a quartz rock in the Rhine River near Bingen. The date of the erection of this tower is not known certainly, but it is said by some authorities to have been built by Bishop Siegfried in the twelfth century as a toll-house. An old tradition connects the tower with Hatto II, Archbishop of Mainz, who lived some 200 years before the time of Siegfried. The story runs that Hatto was devoured by mice in this tower as a punishment for his cruelty in burning a barn filled with people whom he had caught stealing grain in time of famine. It is possible that the name Mouse Tower, *Mäusethurm* in the German, is a corruption of *Mauththurm,* or toll tower, and that the legend arose from the fact that the duty collected on corn was especially unpopular. Another explanation of the name is that it came from the German word *musen,* to spy, the tower having been used as a watch tower. The story has been kept alive by Southey's ballad of *Bishop Hatto.*

Moving Pictures, the name commonly given to representations, suitably enlarged by projection on a screen, of a series of photographs of objects in motion, thus producing a semblance of the original movements in the same sequence and at approximately the same speed.

The moving picture is in reality an optical illusion, depending for its effect upon the persistence of visual impressions, a phenomenon known to primitive man when he made a cricle of fire by whirling a torch around rapidly, and also observed the objects illuminated by an instantaneous flash of lightning. This power of seeing by an instantaneous illumination, and the persistence of vision for a limited time after the light has gone, made the moving picture possible. In other words, moving pictures depend upon the fact that we can see instantly, but we cannot stop seeing instantly. This persistence of vision, during which the retina of the human eye retains an impression, last for a fractional part of a second, varying from one-sixteenth to one-twentieth.

Many eminent scientists have contributed to the development of moving pictures, and it was not until the closing years of the nineteenth century that the apparatus for their production began to approach perfection. But within a quarter of a century, the moving-picture industry has grown to mammoth proportions, and every hamlet now has its "movie" theater. In 1920 it was estimated that there were nearly 30,000 theaters showing motion pitcures in the United States; that these theaters were attended by 13,000,000 people daily, and that these people spend more than $2,000,000 each day in admission fees.

The first machine that depended for its interest on the idea of continuous motion was "the Wheel of Life," which made its appearance in England in 1833, but this was a toy. It consisted of a hollow cylinder with drawings on the inside which, viewed through slits in the upper part of the cylinder while it was rotating, gave the idea of continuity of motion. The painted representations on the inner surface showed a horse galloping, a figure dancing, or some other animated motion. Many similar toys followed in England, and when the Wheel of Life was brought to America, in 1845, others were invented here, including the Zoetrope, which marked some advance and may indeed be regarded as the forerunner of moving pictures. But this was also a revolving cylinder, with painted figures on the inside.

Then came Dr. Sellers of Philadelphia

with the invention of the kinematoscope, during the Civil War. He used the machine to show photographs of his sons in motion, and this was the first machine to give the illusion of real people moving. The machine had a stereoscopic hood, through which the photographs were viewed. The pictures were placed on a circular dash or paddle-wheel, and revolved by means of a wooden knob. Dr. Sellers understood the scientific principle of the moving picture when he said: "It must be done by showing a succession of pictures (taken in different positions of the moving object) with sufficient rapidity to insure the image of one being retained on the retina until the next is brought into view." He not only knew why moving pictures gave the idea of continuity of motion, but also knew that the pictures should be at rest during the moment of vision.

The world was thus informed that the principle of the persistence of vision was the key to the problem of animated pictures, and inventors on both sides of the Atlantic got busy. Three years after Dr. Sellers' statement, Docus, a Frenchman, invented a machine of improved type by means of which, he said, he was enabled to "reproduce the passing of a procession, a review of military maneuvers, and, if so desired, the grimaces of the human face,"—which sounds odd in these days of high-salaried motion picture stars.

As the result of an argument among California horsemen in 1872, Edward Muybridge, an Englishman employed by the United States Geodetic Survey and an enthusiastic photographer, made a famous series of photographs of racing horses to decide the question whether a running horse has all its feet off the ground simultaneously. He set up twenty-four cameras in a row, with threads attached to the shutters and stretched from the shutters across the race-track; as the horse ran by, the threads were broken, the shutters released, and the camera plates exposed. Good pictures being finally obtained, it was proved that the horse did have all its feet off the ground at one moment; but Muybridge was not satisfied with this result of the experiment. Aided financially by governor Leland Stanford of California, he developed instantaneous photography in a marked degree, analyzed motion, and then turned his attention to the problem of projecting the pictures on a screen and reproducing the motion. His machine, called the zoopraxoscope, described publicly in 1878, created a sensation, but showed no great advance in optical results, though it was an important step toward moving pictures, and was exhibited in 1893 at the Chicago World's Fair, where Muybridge received a certificate of honor.

It was the invention of a light, flexible medium for taking a rapid succession of photographs of objects in motion, to replace the slow and cumbersome glass plate, that finally gave us the modern moving picture. Credit for the flexible film belongs to several inventors, the first being Thomas A. Edison, who made a collodion film to carry the photographic emulsion, and this led to his subsequent invention of the kinetoscope, one of the earliest successful moving-picture machines. George Eastman also experimented with various materials for flexible film, but it was the Rev. Dr. Hannibal Goodwin who hit upon the idea of using celluloid to carry the emulsion, and it was soon manufactured in large quantities.

The first patent for a flexible photographic film was taken out in the United States in 1887. In making such a film, nitrated cotton, or pyroxylin, and camphor in a suitable solvent such as wood alcohol and amyl acetate, is poured on a smooth surface, and the solvent evaporates, leaving a thin film. As the film must be entirely transparent and uniform in appearance and thickness, great care in its manufacture is necessary. The development of moving pictures has tremendously increased the demand for this material, and its daily output runs into hundreds of thousands of feet.

Edison's peephole kinetoscope, which was also exhibited at the World's Fair in 1893, gave a tremendous impetus to moving pictures, and Robert Paul of London, Charles Pathé and Lumiere of Paris, and C. Francis Jenkins, a young man of Richmond, Ind., employed in the Treasury De-

partment at Washington, soon made important improvements. Jenkins' invention was, in fact, the first crude model of the modern moving-picture projection machine. By a curious combination of business circumstances it came to be known as the Edison Vitascope. Dozens of more or less similar machines were soon on the market, in England, France, and Germany, all using different sizes of films with various styles of perforations. In a few years, however, films were standardized, so that now the films of any manufacturing company can be used on any machine.

The moving-picture camera, with which objects in motion are now photographed, appears much like an enlarged box camera, with the addition of a crank on the side and a dial to measure the amount of film used. It is mounted on a tripod which is also movable, either laterally or horizontally, by means of cranks. A ribbon of celluloid film is used, 1⅜ in. wide, and supplied in long strips, the average length being 200 ft.

Motion-picture photography, in all essential points, is really continuous snapshot photography. By turning the crank at the side of the camera the photographer, or camera man, is able to get continuous photographs of a person or object in motion. Each of these photographs taken in succession on the strip of film is only three-quarters of an inch high, and sixteen separate photographs can thus be taken on each foot of film in the camera. The camera man also takes the pictures at the rate of sixteen per second in average work, and they are projected to the screen at the same rate when exhibited as moving pictures.

Turning the crank of the camera operates two separate mechanisms, namely, the shutter and the device for feeding the film. The shutter is a revolving disk in which a V-shaped opening is cut, or else the aperture is formed by two disks superimposed, whereby the operator can vary the size of the opening. The side crank is connected by gears to the shutter, which is placed between the film and the lens. It is opened to permit of the brief exposure of the film necessary to take a single picture, and is then closed while another ¾-inch section of film is moved into position for taking the next picture. This operation is repeated rapidly over and over again, by turning the crank continuously, until an entire scene is photographed on the film.

There are two light-tight boxes in the motion-picture camera, one above the other. The top box holds the unexposed film, and the other receives the film after exposure. The film is perforated along each edge with oblong holes each one-eighth inch wide and one-sixteenth inch in height. The device for feeding the film may be either of sprocket-wheel or claw-hammer type, and engages in these holes, which also serve a similar purpose in the projection machine, and in the processes of developing the negative and printing the positive films. Accurate perforation of the film is absolutely necessary, this being done by the manufacturer.

The apparatus for projecting moving pictures to the screen for exhibition purposes employs the principle of the magic lantern, with the addition of mechanical devices for feeding the film rapidly between the light with its condensers and the lenses. See PROJECTING MACHINES.

The first moving pictures widely shown were outdoor scenes, including moving trains, fire department runs, animals in motion, etc. Then came travel pictures taken from the back platform of a train or from the rear of a moving vehicle, and the early slapstick comedies, which rapidly grew in popular favor. The first long film produced was entitled *The Great Train Robbery,* containing 800 feet of film, and later came the era of million-dollar productions and serial pictures. At first motion pictures were all photographed outdoors. The Edison Company built the first sheltered studio for motion-picture making, about 1905. Today Hollywood, a suburb of Los Angeles, Cal., is the chief seat of motion-picture production, but there are many other immense studios in California and in the eastern states. Elaborate pictures are made in these studios, but practically all pictures contain outdoor scenes that are staged outdoors amid appropriate scenery "on location."

Moving pictures showing objects in nat-

ural colors are taken by means of two cameras, which photograph separately the red and green rays of the spectrum; the two resulting pictures being superimposed in projection. This method, however, has been found to be only partially successful. "Talking pictures," a combination of the phonograph and the moving-picture machine is employed, require perfect co-ordination of the timing of each machine, and have also met with only partial success, although it is probable that these mechanical difficulties will in time be overcome, so that it will be feasible to depict the entire action of a drama with the concurrent speech of its characters.

In present-day use of moving pictures, the entertainment or amusement feature is perhaps predominant; but the religious, educational, economic, and scientific use of this powerful means for portraying action has never been lost sight of, and is of growing importance. Censorship of moving pictures is a matter for regulation under the police powers of municipalities, and the motion-picture industry, through its leading representatives, has taken steps in recent years to prevent the production and exhibition of improper pictures.

Motion pictures are the offspring of science through some of the finest minds that the world has known. It is simply for the finest art, the best science, and the highest aspirations of mankind to take this powerful agent—their offspring—and put it to the real service of humanity.

Mowat, Sir Oliver (1820-1903), a Canadian jurist and statesman, was born at Kingston, Ontario, and educated there and at Toronto. He was called to the bar in 1841, and practiced at Kingston and Ontario. He was elected to the Canada Assembly for South Ontario in 1857. Sir Oliver was provincial secretary in 1858, postmaster-general in 1863-64, and judge of the Ontario court of chancery from 1864 to 1872. Sir Oliver resigned from the bench in the latter year, was elected leader of the Ontario Liberals, and was made premier of the province. In this capacity he served for twenty-four years, longer than any premier before or after him. During his incumbency a number of vital questions affecting the relation of the province to the Dominion arose, and he showed great ability and acute legal knowledge in solving them. In 1896 Sir Oliver secured the Ministry of Justice in the Laurier cabinet, and following his resignation in 1897, he served as lieutenant-governor of the province.

Having always been interested in legal reform, in 1856 he was placed on a commission for the consolidation of the general statutes of Canada and Upper Canada. It was while he was premier that an act for the establishment of a high court of judicature was passed, which had for its purpose the joining together of the courts of law and equity. For many years Sir Oliver had been in favor of this measure.

Mowbray, Henry Siddons (1858-), an American artist, born of English parents in Alexandria, Egypt. He was brought to the United States in 1859. Taking up art as a career, he went to Paris, where Bonnat became his master. His paintings and illustrations show remarkable draftmanship, warmth of coloring, and taken as a whole, are delicate and subtle in conception. Among his well-known paintings are *A Lady in Black* (Buffalo Academy) and *Idle Hours,* (National Gallery, Washington). Among his mural decorations, in which he is unusually successful, may be named the beautiful decorations for the Library of the University Club, New York, these being adaptations of the Pinturicchio frescoes in the Vatican. Other beautiful decorations are the *Development of Law,* in the appellate court, New York, and mural paintings in the Congressional Library, Washington. He has also executed many commissions for private residences.

Mower, in haymaking, a machine for cutting grass. The mower differs from a reaper in allowing the grass to fall without gathering. The present day side-cut mowing machine is the modern farmer's chariot. The ancient war-chariot, we are told, carried projecting blades that cut a swath through the ranks of the enemy, while the modern machine carries a cutter bar and set of knives that lay low a swath of grass. The cutter bar may be hinged to the frame in front of the wheels or behind the wheels.

The front position brings the work under the driver's eye. The bar slides along the ground resting in a shoe or runner at each end. The inner shoe is hinged to the frame so that the bar follows the slope of the ground quite independent of the wheels. One lever enables the operator to tilt the cutting edge of the bar up or down according to the smoothness of the ground and the length of stubble desired. Another lever enables the operator to raise the bar from the ground or to throw it up into a vertical position in order to pass by a stone or stump. As the bar assumes a vertical position, the pitman ceases to play. When the bar falls, the pitman resumes its strokes. The construction of a mower is surprisingly simple, but a description of the mechanism is useless to one familiar with the machine and is unintelligible to one not familiar.

The development of the mower from the old sickle and time-honored scythe is really a part of the development of the reaper. The essential part of the invention, after all, is the play of the knives through steel guards affixed to the cutter bar. The guards thrust themselves into the standing grass. As the knives play to and fro through the guards, the stalks are caught between knife edge and guard and are cut faster than the operation can be described. Experience has settled upon about twenty-two strokes of the pitman per yard of advance. One of the earlier devices designed to cut grass consisted essentially of a whirling circular blade that hung flat, that is to say, horizontal beneath the frame. It operated like a circular saw, presenting a flat surface to the ground. The width of the swath equaled the diameter of the blade. The edge played against a whetstone to keep it sharp. The inventor, a Mr. Jeremiah Bailey of Chester County, Pennsylvania, had faith that he had hit upon a wonderful labor-saving invention. "It has been extensively used," said he, "and appeared during the last season. It is understood that it will mow ten acres per day." See REAPING.

Mozart, Wolfgang (1756-1791), a noted German musician. Mozart was born at Salzburg, Austria. He was the son of an organist. He was a musical prodigy. At five he composed little minuets. Between the ages of six and ten he was taken by his father on a tour through Austria, Germany, Belgium, France, England, and Holland, receiving the most flattering receptions everywhere. Kisses, constant applause, and little gifts were showered on the young favorite. He was all the rage in Paris, but returned home no richer than when he set out. A catalog of Mozart's compositions gives 626 numbers, including operas, symphonies, instrumental music of every description, church music, and an inexhaustible collection of piano pieces. Mozart is considered by many the world's greatest musical genius; but he received little worldly recognition. A position as organist in Salzburg and later as composer to the imperial court at Vienna were so poorly paid that Mozart lived in poverty, died in want, and was buried in obscurity, his own wife being afterward unable to identify his grave.

Much Ado About Nothing, a comedy by William Shakespeare, produced in 1597-1598, and printed first in 1600. This is regarded as one of the best of Shakespeare's creations. There is a perfect blending of the tragic and comic elements. The main plot is malicious, and comes near ending in tragedy; but the catastrophe is averted by a stupid blunder. There are several secondary plots, all of an amusing character. Three striking characters appear; Beatrice and Benedick, whose "conversation sparkles with wit to this day undimmed," and Dogberry whose "arrant stupidity has never been equaled in literature." But not one of these three prominent characters is the main agent of the plot. He upon whom the action hinges is of little interest in himself. "Take out Beatrice, Benedick, and Dogberry, and there remains just enough to show how little was the nothing which the much ado was about."

Perhaps the middle point of comedy was never more nicely hit than in *Much Ado About Nothing,* in which the ludicrous blends with the tender, and our follies, turning round against themselves, in support of our affections, retain nothing but their humanity.—Hazlitt.

Mucilage. See GLUE.

Mud Hen. See COOT.

Mud Puppy, an animal of the salamander kind. The body is formed like that

of a salamander save that it is two or three inches in diameter and is about a foot long. Feet and head are those of a salamander. The peculiarity of the animal is its gills. These are of a dark red color and wave like branching coral at each shoulder entirely outside of the gill openings. They are retained through life. The mud puppy is an inhabitant of the muddy lakes and rivers of the upper Mississippi Valley. It lives on snails, insects, and worms. Once in a while a mud puppy takes a bait intended for a fish and is brought to the surface. Otherwise it may be said to cling close to the mud.

Mudturtle. See TORTOISES, TERRAPIN, and TURTLES.

Mugwump, a name given to members of the Republican party who refused to support James G. Blaine, the party's presidential candidate in the election of 1884. They gave as their reason that the Democratic nominee, Grover Cleveland, to whom they gave their support, would do more than Blaine to further civil service reform. The name as used now means a man who refuses to adhere strictly to the actions and principles of his party. Mugwump is from the Algonquin Indian dialect, and means "big chief."

Mühlbach, Louise. See MUNDT, K. M.

Muir, mür, **John** (1838-1914), an American naturalist and traveler. He was born at Dunbar, Scotland, April 21, 1838. His father emigrated to America in 1849 and settled near Fox River, Wisconsin. Young John helped clear up the farm. He was an inventive sort of a chap. While a boy at home he made a rough thermometer by taking the end rod of his father's wagon box and fastening it to the side of the house, so that the expansion and contraction of the rod turned the finger on a large dial. He tinkered all the clocks in the neighborhood and built a wooden one for the family. He worked out a plan for an automatic bedstead that might be set to throw the sleeper out on his feet at any desired hour in the morning. In addition to tinkering with mechanical toys, he was fond of reading. His father had a good, old-fashioned Scotch notion that the Bible, Shakespeare, *Pilgrim's Progress,* Milton, and Burns' poems were good reading for a boy, but Scott's novels were forbidden. Reading, however, never crowded out inventions.

In 1860 the neighbors, who regarded John as a genius, induced him to exhibit his various contrivances at the state fair in Madison. John did so. He mingled modestly with the crowd and was much pleased by the interest which his exhibit aroused. His attention was directed to the state university in that city. He attended four years but left without a diploma. Both Wisconsin and Harvard later granted him honorary degrees.

After leaving college, he earned money in various ways,—by teaching school, working on the farm, and by making rake and pitchfork handles. He entered a carriage factory at Indianapolis. While here he accidentally injured the sight of one eye. He was already much interested in botany and geology, much given to long rambles, lasting sometimes for weeks. Fearing that he might become blind before he had seen much of the world, Muir resolved to devote himself to exploration. In 1867, with a plant press, the New Testament, Burns' poems, and Milton's *Paradise Lost* in a bag on his back, he started from Louisville for Florida. He tramped over 1,000 miles in Florida and Cuba, collecting plants, sleeping out of doors, and living on berries and game, or accepting the hospitality of those he met.

The details of his excursions are beyond the limits of this article. He tramped in Panama and in California; he took a trip to Alaska, where he discovered Glacier Bay and Muir Glacier; he traveled in the valleys of the Yukon and the Mackenzie; he visited Switzerland; and in 1880 he went with De Long on an arctic expedition. He lived for ten years in the Yosemite valley, studying the mountain formation and the big trees. He wrote many articles for American periodicals. The government reservations known as Sequoia and Yosemite parks were due to interest aroused by him. He was one of the greatest authorities on glaciers and on the giant trees of California. His writings have a fascination of their own. Muir was married in 1879 to the daughter of a California physician. He established a home in the California hills,

near a little station about thirty miles east of San Francisco. The following quotation is characteristic:

> Climb the mountains and get their good tidings. Nature's peace will flow into you as sunshine flows into trees. The winds will blow their own freshness into you, and the storms their energy, while cares will drop off like autumn leaves.

See GLACIER; SEQUOIA.

Muir Glacier, a field of ice on the coast of Alaska. It was named for John Muir, the eminent naturalist, who visited it in 1879. It flows from the southeastern or continental slope of the southern part of St. Elias range into the head of Glacier Bay. Although there are greater and more elevated ice fields in Alaska, the Muir Glacier is considered the most remarkable on the western continent. It embraces an area of 354 square miles. When first seen by Muir it was a live glacier, a mass of ice advanced into the sea, forming a mighty wall two miles long and 250 feet high. The bay was comparatively free from ice. Tourists in ships approached the foot of the wall in awe and amazement. Great ice masses toppled into the sea with a noise like thunder. The towering wall, the rending of the ice, the echoes, the splashing of water, and the bobbing icebergs combined to render a visit the event of a lifetime. In 1889 an earthquake precipitated the front of the glacier into the sea, and so filled the bay with icebergs that ships were unable to enter for nine years. Now that the service has been resumed it is found that the front has suffered serious change. A hill, only the peak of which could be seen inland, now divides the glacier into two arms. One arm is "live"; it still reaches the sea and icebergs break from it with fearful crashes. The other arm is dead; it melts away four miles before it reaches the sea and is separated from the shore by a wide moraine. Davidson Glacier, a tongue of Muir Glacier, is ascended by tourists. There is no regular landing, but the adventurous go ashore in small boats.

Mukden. See MANCHURIA.

Mulatto, the child of parents, one of whom is a negro, the other a white person. The mulatto has a yellow complexion and frizzled hair and more nearly resembles the white race. The corresponding mixture of European and American Indian blood is designated as half-breed. A quadroon is the child of a white person and a mulatto, and is therefore three-fourths white. An octoroon is the child of a white person and a quadroon, and is seven-eighths white. No attempt was made in the last United States census to distinguish between those of full negro blood and those partly white, though it is believed that, as a matter of fact, 3,000,000 or one-third of the negro race now in America is of mixed blood. See NEGRO.

Mulberry, a tree of the nettle family, related to the hop and to the Osage orange. It has a milky juice, broad leaves, and an aggregate fruit reminding one of a blackberry. The black mulberry is cultivated for its fruit, chiefly in Europe. The red mulberry is native to the United States, ranging from Massachusetts and Kansas to Florida and Texas. It is cultivated for its fruit and is not without value for lumber. The white mulberry is an Old World species. It is raised for its fruit, but chiefly for its leaves. The latter are the natural food of silkworms. See PYRAMUS AND THISBE; SILK.

Mule, a hybrid animal produced by a jackass and a mare. The foal of a stallion and a she-ass is called a hinny. A mule may be of either sex, but does not ordinarily produce young. Designed to be facetious, the statement is literally true that "the mule is without pride of ancestry or hope of posterity." In the same strain it may be said the mule is reviled by fashion, abused by army teamsters, abhorred by musicians, and ridiculed by humorists.

The mule has the large head, long ears, stiff, upright mane, slim, narrow tail, and narrow, pointed hoofs of the ass. It inherits in part the size, shape, disposition, and strength of the mare. The mule is a type of obstinacy. It is an exceedingly tough, strong, long-enduring animal, able to live on rough food and to endure a degree of heat to which a horse would succumb. Portions of France and Spain are noted for mules of superior quality. American flour is carried on the backs of mules over the ranges to the mountain villages of Spain. An account of Spanish smuggling would be quite incomplete without a de-

View of Glacier from Top

Face of Glacier

MUIR GLACIER, ALASKA

scription of a mule train. The mule is a surefooted pack animal, treading mountain trails in single file with great intelligence and docility. In medieval times it was a mark of dignity to ride a mule richly decked in gold-embroidered trappings and decorative bridle. Wealthy merchants and dignitaries vied with each other in the expensive riding equipment with which they bedecked their mules.

Texas and Missouri are the prominent mule-raising states. The mule is the principal beast of burden and of agriculture in the cotton belt. The Southern mule of caricature is a dejected, sorry looking scarecrow, driven by a single line in the hand of a shiftless colored driver having one suspender and little else. The actual mule is a trim, easy-gaited, efficient fellow, ready for work, and ready for fodder, an indispensable work animal in a large extent of rich, hot, agricultural territory. The mule steps off before the plow uncomplainingly under conditions of heat that the magnificent but sweating farm horse cannot endure.

According to the last agricultural report there were in the United States 4,209,769 mules and 19,833,113 horses. The average value of mules in 1920 was $143.45. Texas led the states of the Union in 1922 with 863,000 mules, and was followed by Georgia, 394,000; Missouri, 377,000; Tennessee, 346,000; Oklahoma, 337,000; and Arkansas, 328,000. Brazil, at the last census, had 3,207,940 mules; Spain had 1,249,912; Argentina had 565,069; Italy had 496,743; Chile had 51,411; Cuba had 64,570; and the Union of South Africa had 92,795. From this it is seen that while the United States still leads the world in the raising of this valuable animal, Brazil has become a close rival.

Mull, a soft, semi-transparent muslin. It is bleached a pure white or dyed in delicate colors. Swiss mull is finished with starching. Silk mull is a very thin, soft silk. Mull of all kinds is used for neckwear, millinery purposes, and for women's party dresses, etc. The name mull is an abbreviation of mullmull, from the Hindu *malmal,* the name of a thin bleached muslin imported from India.

Mullein, mŭl′lĭn, in botany, a genus of the Scrophularia family. It is related to the snapdragon, "butter and eggs," monkey flower, gerardia, and painted cup. There are four species in America. All are immigrants from Europe. The common mullein is a tall, stout, coarse, woolly weed. The stem is unbranched, and grows often as tall as a man. It is crowded with heavy, densely woolly leaves. The bases run down the stem, giving it an angled appearance. The stem terminates in a spike of sessile, yellow, irregular flowers. It is a common plant in old fields and by the wayside. Grown from the seed, a rosette of leaves is produced the first year. The flowering stalk shoots up the second season. After going to seed the plant dies.

Large, placid mulleins, as summer advances, velvety in texture, of a light greenish-drab color, growing everywhere in the fields—at first earth's big rosettes in their broad-leav'd low cluster—plants, eight, ten, twenty leaves to a plant—plentiful on the fallow twenty-acre lot, at the end of the lane, and especially by the ridge-sides of the fences—then close to the ground, but soon springing up—leaves as broad as my hand, and the lower ones twice as long—so fresh and dewy in the morning—stalks now four or five, even seven or eight feet high. The farmers, I find, think the mullein a mean, unworthy weed, but I have grown to a fondness for it.—Walt Whitman.

Müller, Frederick Max (1823-1900), a noted philologist. Born at Dessau, Germany. He was the son of Wilhelm Müller, a German poet. He was educated at the University of Leipsic. He made a specialty of Sanskrit, the literary language of the ancient Hindus. In 1846 he went to London by way of Paris and laid plans for an edition of the Rig-Veda, a Sanskrit work, before the officials of the English East India Company. The company undertook to bring out the work. It appeared in several volumes from 1849-1874. He was defeated for the chair of Sanskrit in Oxford University, but in 1868 was made professor of comparative philology. He was the most noted Sanskrit scholar of the century. His published works make a long list. They cover a wide range of English and Indian subjects. The best known titles are *The Science of Language, Essays on Language and Literature, Biographies of Words, Chips from a German Workshop,* and *A Sanskrit Grammar.* He wrote an

autobiography which appeared the year after his death. Max Müller was a profound student. He wrote in English. He may be regarded as a typical product of the German University.

I am not going to add a chapter to that most unsatisfactory of all studies, child-psychology. It is an impossible subject. The victim—the child—cannot be interrogated till it is too late. The influences that work on the child's senses and mind cannot be determined; they are too many, and too intangible. The observers of babies, mostly young fathers proud of their first offspring, remind me always of a very learned friend of mine. who presented to the Royal Society most laborious pages containing his lifelong observations on certain deviation of the magnetic needle, and who had forgotten that in making these observations he always had a pair of steel spectacles on his nose.—*Autobiography.*

Müller, Johannes (1801-1858), the most important and influential physiologist of his time, was born at Coblenz, Rhenish Prussia. He studied theology, which he abandoned for medicine, beginning this study at Bonn. After his graduation he went to Berlin, where he continued his studies. In 1830 he was appointed professor at Bonn. Müller, who was unusually gifted, now interested himself in new and different fields of research. He published important works during this period on specific nerve energies and several works on general pathology.

In 1834 he was appointed a member of the Berlin Academy of Sciences. His knowledge of physiology was broad, and he worked along new lines and was the founder of a new school. To him physiology is indebted for the foundation of Bell's law, the principle of reflex movements and other nervous activities; comprehensive and detailed views on vision and hearing; a well-founded knowledge of the nature of the blood, lymph and chyle; the proof of the independence of the quality of glandular secretions from the grosser structure of the glands, and the knowledge of chondrin.

Müller did not endorse the findings of the nature school of philosophers, but proceeded to place physiology on a firm footing, and he was the leader of the new science of morphology. He made numerous other researches in the structure of glands and the vocal cords, and introduced the idea of fever as a nervous reflex. He wrote many books of a scientific nature, all of which give evidence of his skill and learning.

Mullet, in Europe, a salt water fish one to two feet long, with the general appearance of a slender perch or bass. It has fleshy lips and naturally lives by working over the mud at the bottom of the water from which it extracts small animals. The mullet was a favorite fish on the tables of Roman epicures. It was common enough, being raised in fish ponds. As high as $200 is said to have been paid by the Romans for an unusually large specimen. The ordinary weight is from six to seven pounds. There are, in all, about seventy world species of mullets. The common silver mullet of the Gulf States is about nine inches in length. It is a swift leaping fish, much in demand by pelicans, darters, and other fish-eating birds. Of American fish it is fourth in commercial value. It is the common fish of Southern markets. The last census gave $1,151,103 as the total value of mullets taken off the coast of Florida.

Mulock, Miss. See CRAIK, DINAH MARIA MULOCK.

Mulock, Sir William (1843-), a Canadian statesman and jurist, born at Bondhead, Ontario. He was admitted to the bar in 1868, and in 1888 became queen's counsel. He was elected a Liberal member of the House of Commons in 1882, and in 1896 became Postmaster-General in the administration of Sir Wilfrid Laurier. The introduction in Canada of a penny-postage rate was largely due to Sir William's efforts. While he was Postmaster-General he introduced legislation establishing the Department of Labor, and became its first minister (1900-05). In 1881 he became vice chancellor of the University of Toronto, and retained this position for 9 years. In 1905 he was appointed the first chief justice of the exchequer division of the high court of justice, Ontario. He was knighted in 1902.

Multiplication. See ARITHMETIC.

Mummy. See EMBALMING.

Mumps, an acute infectious disease characterized by inflammation of the salivary

glands. Although not positive, physicians are of the opinion that the disease, like measles, scarlet fever, and whooping cough, is due to a specific bacterium or bacillus; that is to say, a minute plant, which is communicated from person to person and breeds rapidly in the saliva. Boys are more apt to be afflicted than girls. The disease shows itself from seven to fourteen days after exposure. It reaches its height in from three to four days, then goes down rapidly, lasting from four to ten days. There seems to be no way of cutting it short. The danger from mumps is so slight that the swollen cheek of the patient is ordinarily a source of amusement to his friends.

Münchhausen, mŭn-chaw′sen, **Baron** (1720-1797), a German soldier. He was a native of Hanover. As a soldier he was a harum-scarum, dare-devil sort of fellow, getting into no end of scrapes. He served in the Turkish campaign of 1737-9. He had a wonderful faculty of telling tales of personal adventure in which a lively imagination was allowed full play. Many of these stories he drew from ancient volumes. His *Table Talk* and *Wondrous Tales* were compiled by an acquaintance under the title of *Baron Münchhausen's Narrative of his Marvelous Travels and Campaigns in Russia.* His surprising adventures rival those of Swift's *Gulliver.* There is his tale of a night's lodging, for instance. Traveling through a snowy waste, he sought an inn far into the night. At last, in utter weariness, he tied his saddle horse to a stake, as he supposed. Then, wrapping his military cloak about him, he lay down on the snow to sleep. When he awoke in the morning he lay on the bare ground. The snow had melted. His faithful steéd hung by the halter from the village steeple sixty feet above the earth. The Baron was equal to the emergency. Drawing his pistol he cut the halter strap with a well directed bullet. His horse slid to the ground uninjured and the veracious traveler continued his journey.

Muncie, Ind., the county seat of Delaware County, is on the west fork of White River, 54 miles northeast of Indianapolis and 60 miles south of Fort Wayne. It is served by the Chesapeake & Ohio, Pittsburgh, Cincinnati, Chicago & St. Louis, Central Indiana, Lake Erie & Western and Cleveland, Cincinnati, Chicago & St. Louis railroads and by several interurban electric lines.

Muncie is important as an industrial and commercial center. It is in the center of the Indiana gas fields and near good coal deposits, and because of this its industries are continuously expanding. A partial list of the products of its numerous manufactories includes iron and steel, glass ware, silver ware, caskets, lawn mowers, gas engines, steam boilers, iron beds, automobiles, knit goods, clothing, fruit jars, wagons and wheels.

The city has two parks, a Federal building, Carnegie library, court house and three hospitals. The public schools are entirely modern and are supplemented by the Muncie Normal Institute. In 1920 the population was 36,524.

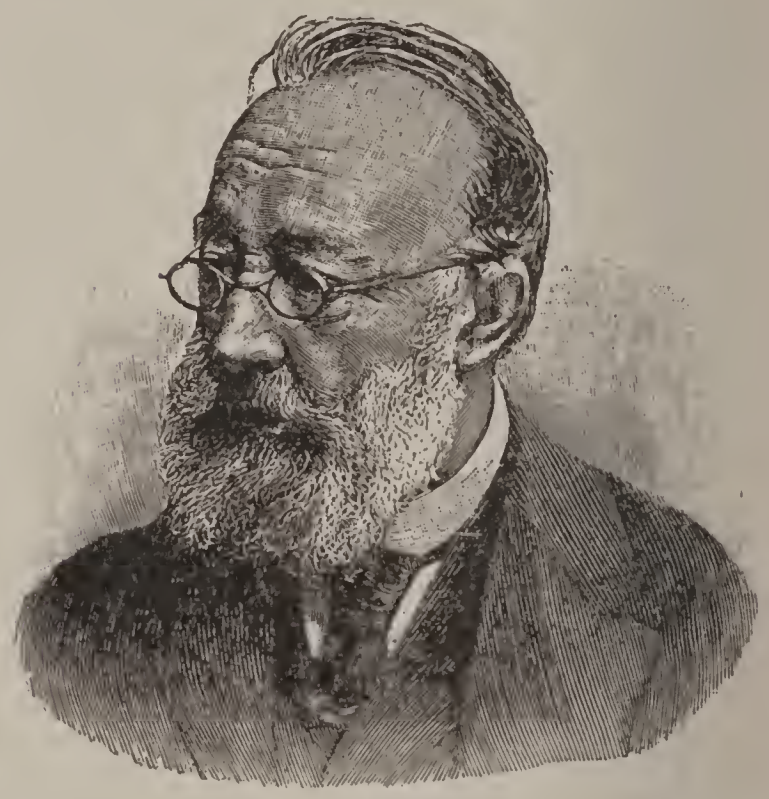
Mundelein, Rt. Rev. George William (1869-), a prelate of the Roman Catholic church in America, who is notable as having been at various times the youngest monsignor, the youngest bishop, and the youngest archbishop in the United States. In 1895 he was ordained a priest, and was appointed monsignor in 1905. In 1906 Archbishop Mundelein was made a member of the Ancient Academy of the Arcade, and is the first American upon whom this honor has been bestowed. Receiving the degree of Doctor of Sacred Theology in 1908, he was consecrated auxiliary bishop of Brooklyn in the following year. In 1915 he was chosen archbishop of Chicago, said to be the most populous Roman Catholic diocese in the world.

Mundt, Madame Klara Müller (1814-1873), a German novelist who wrote under the pen name of Luise Mühlbach. She was born at Neubrandenburg. She was married to Theodor Mundt, himself an author, in 1839. Madame Mundt was the author of a large number of historical novels. They are without special literary merit, but display considerable descriptive power and are so entertaining that they have done much, in England and America, as well as in Germany, to interest young people in

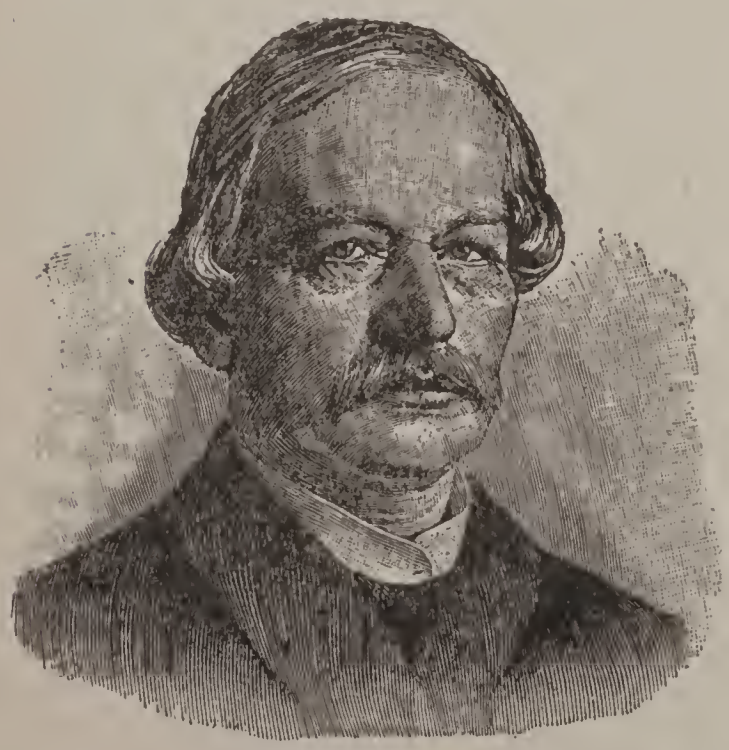
Heinrich von Kleist.

Friedrich Christoph Schlosser.

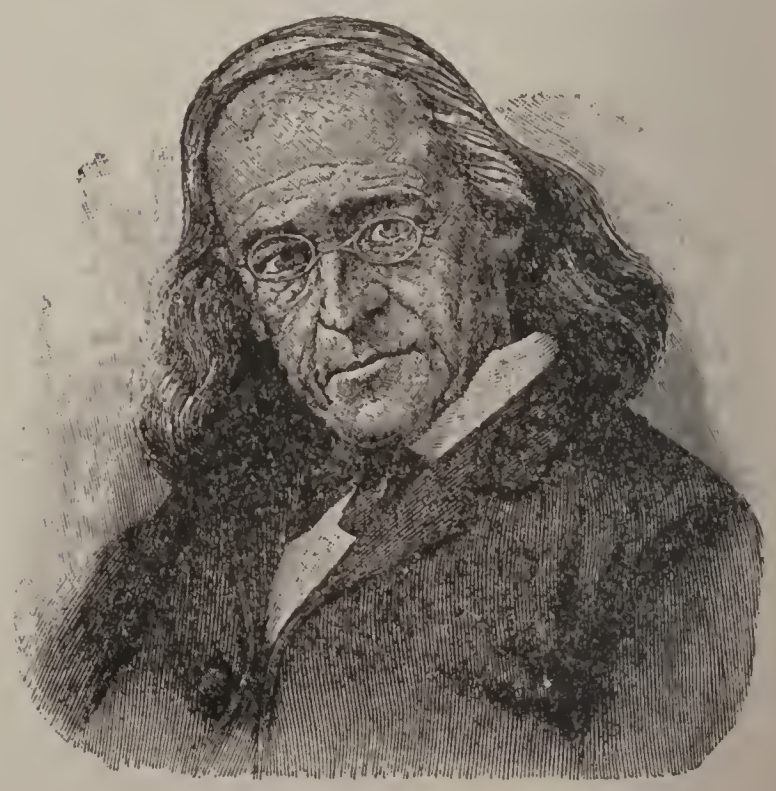
Leopold von Ranke.



Gottfried Keller.



Gustav Freytag.



Theodor Mommsen.

GERMAN WRITERS.

the various historical characters which are presented. Among them may be mentioned *Marie Antoinette and Her Son, Joseph II and his Court, Queen Hortense, Frederick the Great and His Court, Henry VIII and His Court.*

Munich, mū′nĭk, the capital and metropolis of Bavaria. It is situated on a high, level plain on both banks of the Isar. The latter is spanned by nine bridges. The city is considered one of the handsomest in Europe. It was surrounded formerly by walls and ditches. These have been leveled off and converted into boulevards. Three of the old gates, with their lofty, flanking turrets, have been preserved. The city is divided into two parts—the old quarter and the new. Munich is noted for iron and brass manufactures; also for stained glass and optical instruments. It is one of the great centers of beer making, possibly the greatest in the world. The annual production of Munich beer is not far from 50,000,000 gallons, three-fourths of which is consumed in the restaurants and cafés of the city.

From an artistic point of view Munich is one of the most interesting cities in Europe. Buildings have been erected seemingly regardless of expense. Beautiful public squares and gardens are adorned with statues of Joseph, Maximilian II, and other notables. A colossal bronze figure of Bavaria is sixty-five feet in height. The city is almost exclusively Catholic. The cathedral is a vast brick edifice with lofty towers 330 feet in height. The royal, that is to say, the public library contains upward of 1,000,000 volumes and 50,000 manuscripts. The staircase is one of the handsomest library staircases in the world. It is flanked on either side by a gallery supported by marble columns. The walls are adorned with medallion portraits of celebrated poets and scholars. The university library contains in addition 300,000 volumes. The national museum contains a collection of objects arranged historically to illustrate the progress of civilization from the earliest period of Roman occupancy to the present time. A building, known as the Old Pinakothek or the repository of pictures, contains over 1,400 pictures arranged in large saloons, according to schools, that is to say, chronologically. It is one of the most celebrated collections of paintings in Europe. It contains work by Raphael, Correggio, Titian, Murillo, Holbein, Rubens, Vandyke, Rembrandt, Dürer, and other masters. A second building called the New Pinakothek contains modern pictures, including excellent copies of the masterpieces of the older painters. The Museum of Sculpture, known locally as the Glyptothek, shelters a scarcely less celebrated collection of ancient sculpture. There are colossal lions with human heads, and reliefs in alabaster from Assyria; black marble statues, obelisks, and mummies from Egypt; reliefs in bronze, and urns from Etruria; sculptures from the Temple of Minerva in the island of Aegina; and Grecian busts, vases, urns, and statues representing Apollo, Bacchus, Niobe, Medusa, and Venus, almost without end. A mere enumeration of the treasures of art fills a large catalog.

Munich lacks the commercial activity of some European cities, but, as a place of residence for the lover of books and art, it is hardly surpassed. Population, 630,711.

See BAVARIA.

Municipal Government in the United States, the government of cities. Cities in the United States are organized under general state laws, varying widely in the different states. Much dissatisfaction with the charters granted certain cities by the states is manifest in their attempts to secure "home rule" or freedom from control by the legislature. Since the city must be in some respects an agency of the state government and since in the case of a large municipality it is bound to influence the state as a whole, absolute home rule is probably unwise, though beyond a doubt a larger measure of it is needed in many cases.

Most cities are organized with a single executive officer, the mayor, and a legislative body, the council, the judicial phase of city government being cared for either by state and federal courts located in the city or by special police or municipal courts. The council consists usually of one house, though several of the largest cities, including St. Louis and Baltimore, have bicameral councils. So corrupt and wasteful had this system become in many in-

stances, that a number of cities have done away with it entirely and substituted a kind of government known as the "commission form." This had its origin in Galveston, Texas, after the old government had been rendered helpless by the great storm of 1900, which almost destroyed the city. Salvage, rebuilding, and other vital matters presented questions too great for the old machine. A committee of citizens was chosen, and through their efforts a new charter was framed. The government was vested in a mayor and four elective commissioners, forming a board to which was given all power, both legislative and executive. Each commissioner was responsible for the wise and economical administration of one of the four departments created,—police and fire, streets and public property, waterworks and sewage, finance and revenue. The mayor had no department but was expected to harmonize the work of the commissioners. Des Moines adopted the plan and expanded it to include the referendum and recall. By 1911 more than fifty cities had adopted some form of commission government.

CITY MANAGER. A comparatively recent development from, and modification of, the commission form of government is the policy of hiring a city manager, whose duties are to conduct the affairs of the city with the same regard to curtailment of expenditure of money and energy as if he were managing a private enterprise. As a rule there is a small elective commission that does not have legislative or administrative powers but has power to choose a city manager. The latter usually has the right to employ such assistants and minor officials as he needs.

In almost every city in which the city manager plan has been tried it has been successful. One of the best arguments for this plan is that, being removed from immediate contact with politics, the city manager devotes all of his time and energy to serving the public.

Municipal Ownership, public ownership of public institutions in towns and cities. In Great Britain the corresponding term is municipal trading. Public ownership is advocated by the socialists everywhere; but, as a matter of fact, it is a device rather of the mercantile or commercial element. It includes the ownership by the people of gas, electricity, street railways, waterworks, telephones, and other public utilities. The limit of desirable municipal ownership is reached only when the public owns all those agencies that are operated to best advantage by a monopoly.

Some kinds of service are natural monopolies. Rival telephone lines, requiring a business man to pay a charge to each in order to obtain complete service, are unwarranted. Rival gas companies tear up the streets, and lay parallel pipes, and, in the end, are not able to render as efficient service as a monopoly with an exclusive system of pipes.

The chief arguments advanced in favor of public ownership of municipal utilities are:

1. Better service. It is claimed that private owners granted a monopoly are not sufficiently sensitive to criticism. It is quite possible for a private monopoly well entrenched behind a franchise to ignore popular criticism.

2. Extended service. A private monopoly is little inclined to extend a street car line into a region that will not pay expenses. A private company is not willing to make the profits gained in a populous section pay the expense of operating in a sparsely settled portion of the town. To draw an extreme illustration from national affairs, a common carrier will not send a messenger forty miles into the mountains to deliver three letters for a total reward of six cents.

3. Lower rates. Experience demonstrates that private owners can operate at less expense than the public, but experience shows also that private owners are not disposed to give the public the benefit. There are notable exceptions; but ordinarily, when profits pile up noticeably, stock is watered and the public is called upon to maintain rates and pay dividends on additional stock. As Professor Parsons says of public ownership:

> It does not have to retain lawyers or lobbyists or provide for the entertainment of councilmen, or subscribe to campaign funds, or bear the expenses of pushing the nomination and election of men to protect its interests or give it new privileges, or pay blackmail to ward off the raids of

cunning legislators and officials, or buy up its rivals, etc.

4. Public revenue. The argument is simple. Public utilities owned by the public, well managed, yield profits that render ordinary forms of taxation unnecessary.

5. A casual examination of labor statistics shows that hours of labor are shorter and wages are higher under public than they are under private ownership.

6. City councils free from the selfish control of wealthy corporations. The brazen manner in which the "interests" assert themselves in council chambers is offensive and demoralizing.

As to the present prevalence of municipal ownership, it may be said that public waterworks are general. Of the fifty large cities in the United States, over ninety per cent own their own waterworks; nearly all the smaller towns are owners. A similar statement holds true for all English-speaking countries. Glasgow goes thirty-four miles to Loch Katrine for water; Manchester gets water from the English lake district; Liverpool and Birmingham bring water from Wales. In 1902 London bought out eight private companies. There are over a thousand public waterworks in Great Britain. The policy of municipal waterworks is well established in continental Europe.

Municipal gas plants have been tried on a large scale on both sides of the Atlantic. In 1904 the municipal gas plants of Great Britain alone had cost $185,000,000. The British *Municipal Year Book* for 1906 stated that, as compared with rates charged by private gas companies, the cities were saving consumers a total of $3,910,000 a year, that the authorities were paying higher wages for shorter hours, were extending the gas pipes more rapidly, and were turning a seven per cent profit into the city treasuries.

German gas plants are owned chiefly by the cities. Berlin owns four large gas plants.

In the United States city ownership of gas was begun by Richmond, Virginia, in 1853. Not all public plants have been successful. Owing to corrupt politics, public ownership in Philadelphia miscarried; toward the end the loss to the city mounted up to $245,000 a year. After struggling for fifty-six years the city leased its plant in 1897 for a period of twenty years. Hamilton, Ohio, has had difficulty in maintaining a public gas plant. Wheeling, West Virginia, had the usual tussle with city thieves, but in 1887 set the pace by supplying gas at seventy-five cents per thousand. The verdict of private gas companies is unfavorable:

> Wheeling's gas plant is not an important factor in the well-being of Wheeling's citizens. What with fast meters, charges for service and meter-setting, absence of any gratuitous work, the admixture of fifteen-cent, eight candle-power natural gas, insufficient and irregular pressure, and general inefficiency in the complaint department, Wheeling gas is a dear commodity at any price.

For all that, the public is not disposed to return the plant to private ownership. In 1898 Duluth was paying $1.90 for gas. The plant was taken over and by 1905 the price for light and fuel had been reduced to seventy-five cents, with a still lower price of fifty cents per thousand for gas used in engines and furnaces. Bellefontaine, Ohio, and Holyoke, Massachusetts, are named as cities that have succeeded in conducting gas plants honestly and hence profitably.

Despite the fact that the public has been deluged with so-called "public ownership" literature calling attention to actual and alleged failures to stand off the thieves that beset city treasuries, the policy of public ownership has steadily gained ground. In 1900 there were fifteen considerable municipal gas plants in the United States; in 1906 there were twenty-five. At the beginning of the century there were only fifteen noteworthy municipal gas plants in the United States. Now (1923) hundreds of cities in the United States, and many cities in Canada, own their gas works.

The ownership of an electric light plant is a favorite form of municipal activity. It is easier to string wires than to lay pipes, and easier to install a dynamo than a gas plant. City councils are more willing to go into electric lighting than some other forms of public service. In 1902 there were over 800 municipally owned electric light plants in the United States, and in the years immediately following, the number increased rapidly. Detroit, Mich., has been a leader

among the large cities in municipal ownership, and was among the first to obtain control of its lighting system, for both public and private purposes. Experience, however, has proved that it is more economical for large cities to own and operate the plants for lighting the streets, parks, and all other public places, and let private companies provide light for private use, and this plan is now generally followed. However, with the growth of large American cities and the increased demand for light, it became evident that it was more economical and satisfactory for the municipality to own and operate the plants for lighting the streets, parks, and other public places, and let private companies provide the light for private use. In many small cities the municipal plant provides all the light. The creation of a public utilities commission in nearly all states with the authority to fix rates does away with one of the strongest reasons for municipally owned lighting plants.

Publicly owned street railways appeal to workingmen who are required to pay two fares out of each day's wages and stand up both ways at that. Great Britain leads off in the movement for low fares. Glasgow, the second city in the island, not content with taking over the gas supply, cutting the price in two, and turning back a quarter of a million dollars a year into the city treasury, took over the street railways, and has operated them successfully for a long term of years under municipal management; hours of labor were shortened, wages increased, and fares reduced, and the lines have been extended. The gross profits have been sufficient to pay interest on the capital invested, and in normal times, to set aside a fund annually sufficient to cover all general expenses. London owns its tramways, as do many other large cities in the United Kingdom and on the continent of Europe. European cities have considered municipal ownership much more favorably than have cities in the United States, and comparatively few American cities own their street railways. San Francisco owns a part of its system, and in 1920 the people voted to amend the city's charter so that the entire system could be purchased by the municipality. Detroit, Michigan, owns and operates its entire system, and some of the lines in New York City are operated by the municipality.

See NEW ZEALAND; BIRMINGHAM.

Munkacsy, moon-kä′chē, **Michael** (1846-1900), a modern Hungarian painter. He was the son of a peasant named Lieb, and was trained as a carpenter, but took lessons from a strolling artist and adopted the name of his native village, Munkacs, as a surname. His early paintings were so far successful that he was able to study at Munich and later at Düsseldorf. His first great success was *The Last Day of a Condemned Man,* which he exhibited at the Paris Salon in 1870. He then took up his residence in the French capital. Some of his lighter pieces are *Going to School, The Kitchen Politician, The Butler Woman,* and *The Pawn Shop.* Some of his most famous paintings are owned in America. *Milton in His Blindness Dictating Paradise Lost* hangs in the Lenox Library, New York. John Wanamaker of Philadelphia paid $120,000 for *Christ Before Pilate,* and with princely generosity permitted it to be exhibited from city to city for the good it might do. It is considered a masterly work. *The Last Moments of Mozart* was purchased by General Russell Alger of Detroit for $50,000. It is too early for a final estimate, but Munkacsy bids fair to have a place among the noted painters of the world. See PAINTING.

Munroe, Kirk (1856-), an American author of vigorous and wholesome stories for boys. He was born at Prairie du Chien, Wis., and studied civil engineering at Harvard University. While professionally engaged with the Northern Pacific and Southern Pacific railroads he became acquainted with the life and the men he later wrote of. Mr. Munroe was a personal friend of "Kit" Carson and of "Buffalo Bill." He was the first editor of *Harper's Round Table.* In 1883 he married a daughter of Amelia Barr, the novelist, and removed to Florida. His best known books are *The Flamingo Feather, Dorymates, The Ready Rangers, The Coal Ship, In Private Waters, The Outcast Warrior* and *For the Mikado.*

Münster, a city of Westphalia, Prussia. It is situated in a loop of the brook Aa, in a sandy plain midway between Cologne and Bremen. Münster grew up originally around a monastery of the twelfth century. It was long the seat of a martial archbishop. It is still an episcopal residence. Although the medieval walls have been leveled to form promenades, the city retains many of the characteristics of medieval times. The marketplaces are surrounded by covered arcades and picturesque gabled houses. Among buildings of note are the Church of St. Lambert, the City Hall, the Guild Hall of Shoemakers, the Cathedral, the Academy, the Museum of Ecclesiastical Antiquities, and the Historical Museum. See ANABAPTISTS.

Munsterberg, Hugo (1863-1916), a noted German-American psychologist, for years the leader of the experimental school of psychologists. He was born at Danzig, received degrees from Leipzig and Heidelberg universities, and taught psychology at Freiburg from 1887 to 1892. In 1892 Dr. Munsterberg was appointed professor of psychology and director of the psychological laboratories at Harvard University, and in 1910-11 was exchange professor at the University of Berlin. His early writings, such as *Eternal Life* and *American Traits* attracted general attention. Dr. Munsterberg was at first a physiological psychologist, and his popular style of writing won him an immense public. He later broadened his view until he applied the psychological method to the answering of all questions pertaining to everyday life. The result of his study of American life and ideals are particularly valuable. During the World War he showed a pronounced pro-German bias, but the directors of Harvard refused to dismiss him, holding that liberty of opinion is the inviolable right of everyone.

Murat, mü-rä′, **Joachim** (1771-1815), a French soldier. He was the son of a small farmer, some say an innkeeper, near Cahors, France. He was educated for the priesthood, but enlisted instead in the French cavalry. He led a wild, reckless life, and was soon dismissed on the score that his influence led to insubordination. He wandered about Paris like many another adventurer, and formed the acquaintance of Napoleon Bonaparte in the early years of the French Revolution. He again entered the service and made a reputation as a cavalryman. When Napoleon came into power he had use for Murat's recklessness and qualities as a leader. He made him commander of his cavalry. Murat accompanied Napoleon to Egypt and Syria and took part in the battle of the Pyramids. In the famous campaign of 1796, Murat, at the head of the French cavalry, so distinguished himself for gallant charges that he was selected to carry the captured flags home to Paris. In 1800 Napoleon gave him his youngest sister Caroline in marriage, and when he became emperor he fairly covered Murat with decorations and honors. In 1808 Murat was placed on the throne of Naples. He managed the affairs of his little kingdom with ability. He suppressed brigandage and instituted other reforms. After the battle of Leipsic he entered into coalition with Austria against his former emperor on condition that he be guaranteed the independence of Naples. The conclusion of his career is easily told. He quarreled with Austria and was defeated in battle. He lost his kingdom. Landing later with a few adherents on the coast of Calabria, in a forlorn attempt to regain his lost crown, he was taken prisoner by a native commander whose brother he had formerly shot for brigandage. He was tried by court-martial and condemned to be shot within half an hour.

Murfree, mur′free, **Mary Noailles** (1850-), an American novelist, better known by her pen name of Charles Egbert Craddock. She was born in Murfreesboro, Tennessee. Her early years were passed in her native town. She spent many summers in the mountains, where material was collected for her novels. Her first short story was published in the *Atlantic Monthly* in 1878. For some years, until she chose to make herself known, it was believed that her work was that of a masculine writer. *In the Tennessee Mountains, The Prophet of the Great Smoky Mountain,* and *Down the Ravine* are Miss Murfree's best known storics.

Murillo, moo-ree'lyo (1617-1682), the most eminent of Spanish painters. He was born of poor parents at Seville. He studied at Madrid. In the early days of his poverty he painted small madonnas by the dozen for sale to the churches in the Spanish provinces of Mexico and Peru. In 1813 the Duke of Wellington tried in vain to buy his greatest painting, *St. Anthony of Padua,* from the Cathedral of Seville for as many gold pieces as could be placed on the enormous canvas. One picture, the *Conception* was sold in 1852 to the Louvre in France for $120,000. Murillo's pictures may be classed in two groups. Those of his youth are chiefly of beggars, gypsies, and rural life. The other group includes madonnas and other Scriptural subjects. Among these are *St. Anthony of Padua, Moses Striking the Rock, Abraham and the Angels, The Miracle of the Loaves and Fishes, St. Peter Released from Prison,* and *St. Elizabeth.* In 1648 Murillo married a woman of fortune. His home at Seville became the resort of artists and people of fashion. In 1660 he founded the art academy of Seville and became its president. While painting an altar piece for the church of the Capuchins at Cadiz he fell from a scaffold. He was borne home to Seville but did not recover. At one time, it is said to oblige a cook, he painted the Virgin on a napkin. It is still known as the "Virgin of the Napkin."

Murfreesboro, Battle of. See STONE RIVER, BATTLE OF.

Murray, George Henry (1861-), a Canadian statesman, was born at Grand Narrows, Nova Scotia, and was educated at Boston University. He was called to the bar of his native province in 1883 and practiced for some years in North Sydney. Mr. Murray was appointed to the provincial legislative council in 1889, resigning two years later and standing unsuccessfully for the Dominion House of Commons. He was reappointed to the council and was also made miinster without portfolio in the Fielding cabinet. Fielding was called to the Dominion Cabinet in 1869, and thereafter Mr. Murray served as premier and provincial secretary of Nova Scotia. He retired from the premiership of Nova Scotia in 1923, having held the position uninterruptedly for twenty-six years.

Murray, James (1719-1794), a British soldier, was the first Governor of Canada. He was born in England and entered the army in 1840. He served in the West Indies and the Netherlands, rose to the rank of lieutenant-colonel, and was sent with his regiment to America in 1757. He commanded a brigade at Louisburg in 1758, and was one of three brigade commanders under Wolfe in the Quebec expedition in 1759. Murray was in command of the city after it capitulated, and he defended it against a superior French force. He was made governor of Quebec in 1760 and Governor of Canada in 1763. Because of his efforts to make peace between the English officials and the Indians and between the former and the French in Canada, Murray's subordinates accused him of favoritism toward the French. He was recalled to England and court martialed, but was exonerated. He was governor of Minorca in 1774-81, surrendering it to a force of French and Spanish in 1782 after a seven months' siege. In 1783 he was made full general.

Murray, Sir John (1841-1914), a Canadian naturalist, geographer and oceanographer, was born at Coburg, Ontario, and studied there at Victoria College, and at the University of Edinburgh, Scotland. He made a trip into the Arctic regions on a whaling vessel in 1868 for the purpose of studying Arctic flora and fauna. Sir John was with the "Challenger" expedition as naturalist in 1872-76; the purpose of the expedition was the study of the ocean basins of the world with a view to ascertaining their exact size, depth, capacity, etc. When the expedition returned he was made assistant-editor in preparing the "Challenger" reports, and was made editor-in-chief in 1882. The fifty volumes of these reports were finished in 1896, and in 1898 Sir John was knighted. Thereafter he accompanied other expeditions, one of them the "Michael Sars" North Atlantic Expedition. At the time of his death he was considered the greatest authority on oceanography. He wrote a great number of reports and an exhaustive but popular

MUSHROOMS

1-13 Edible Varieties. 14-25. Poisonous Types.

book—*The Ocean: A General Account of the Science of the Sea.*

Murray, Lindley (1745-1826), an American grammarian. He was a native of Lancashire County, Pennsylvania. His mother, Mary Lindley Murray, is the heroine of an incident in the American Revolution. During the retreat of Washington's forces Howe was marching, September 15, 1776, to cut off Putnam's command. Mrs. Murray invited him and his officers to wait for dinner. The good dame hastened to bake and broil, prolonging her preparations. The courteous Howe could not bring himself to disappoint a lady. In all he was delayed over two hours. By that time, Putnam, with his command, was out of danger. Young Murray studied law, but subsequently embarked in a commercial speculation in which he amassed a modest fortune. In 1784 he retired from business and settled at Holdgate, near York, England, where he resided until the time of his death. He was a man of scholarly habits and had a turn for writing. In 1795 he published an *English Grammar* for schools. It became at once the standard text in that subject both in England and the United States. It rivaled *Webster's Spelling Book* in the number of editions through which it passed. Of the last edition, appearing in 1818, it is said that 1,500,000 copies were sold.

Murray, Walter Charles, (1866-), a Canadian educator, was born at Studholm, New Brunswick, and educated at the universities of New Brunswick, Edinburgh and Berlin. He was professor of philosophy and economics at the first named of these institutions in 1891-92, and professor of philosophy and lecturer on education at Dalhousie University during 1892-1908. In the latter year Dr. Murray was chosen president of the University of Saskatchewan, which post he has since held. He is the author of *Studies in Mind Growth* and *Local Government in the Maritime Provinces.*

Murray, William Vans (1762-1803), an American diplomat, was born at Cambridge, Md. He studied law in England and reurned to his native state in 1785, when he was admitted to the bar and began to practice. He rose rapidly in his profession, and soon became one of the foremost authorities of his time. He was a Federalist and for six years was a member of Congress. He served as minister to the Netherlands, and later with William R. Davis and Oliver Ellsworth in 1799 he negotiated a treaty with France, as that country and the United States were on the verge of war. *The Constitution and Laws of the United States* is a very notable volume written by him.

Muses, The, in Greek mythology, goddesses of the arts and sciences. They were the daughters of Zeus and Mnemosyne. Among early Greek writers, the number of Muses and their respective offices are given variously, but among later writers nine Muses were recognized. They were Cal-li'ope, Muse of epic poetry; Cli'o, of history; Euter'pe, of lyric poetry; Melpom'-ene, of tragedy; Terpsich'ore, of dance and song; E'rato, of love poetry; Polyhym'nia, of sacred song; Ura'nia, of astronomy, and Thali'a, of comedy. The Muses were reputed to have entered into contests with the Sirens, with the daughters of Pierus, and with the bard Thamyris, in all of which they won victories. The nightingale, the swan, and the grasshopper were sacred to them. The Muses are represented in art as beautiful maidens, dancing in a circle, often with Apollo. They are crowned with roses, palm leaves, and laurel. In Rome a temple and grove were consecrated to the Muses.

Museum, an institution for the collection, study, classification, preservation, and exhibition of objects of interest. The word is derived from the Muses. It meant originally a grove or other locality sacred to the Muses; later it meant an institution of study and research. The Museum of Alexandria was an institution of this sort. The present day term retains somewhat of former meanings in that a museum offers facilities for research. Doubtless museums in the modern use of the word grew up in connection with institutions of learning. Collections of curious books are included in most libraries. Collections of paintings and statuary are known frequently as art galleries. Europe is the country of museums. If we except Turkey, every European nation, city, and university has its

collection. Paris has over thirty museums; Berlin, twenty; Vienna, fifteen. London has a number of notable collections. Local museums are more general in Great Britain than elsewhere. Some account of the various collections may be found in the articles on the chief cities and buildings of Europe.

There are between 300 and 400 collections in the United States. These, with collections in the Latin American states and Canada, contain a vast amount of American material; yet it is a source of never-ending regret that the contributors to earlier museums did not realize the priceless value of Indian relics now impossible to obtain. There are collections of greater or less importance in connection with each American college and university. Those of Yale, Princeton, Amherst, Leland Stanford, and California University are rich in fossils.

Several states, notably New York and Ohio, have made valuable collections. Philadelphia Academy of Natural Science and Boston Society of Natural History have large and valuable collections, especially of birds. Among American museums of importance are:

National Museum	Washington
Peabody Museum	Cambridge
American Museum	New York
Field-Columbian Museum	Chicago
Free Museum	Philadelphia
Golden Gate Park Museum	San Francisco
Carnegie Museum	Pittsburg
City Museum	Milwaukee

Mushroom, a popular name for a large number of the higher fungi. There are several hundred species. They may be designated in general as flowerless plants, consisting of a stem, surmounted by a cap-shaped structure frequently like that of a parasol. The word is French. The corresponding English word is toadstool. Mushrooms are found in almost all parts of the world. They grow in a great variety of situations, varying from a dark wood to the edge of a sunny sidewalk, and from a compost heap to the shelter of a rock pile. It may be said in general, however, that mushrooms require moisture and decaying vegetable matter for their growth. Young mushrooms are usually white in color. They grow rapidly, giving rise to the popular expression "mushroom growth." An examination of the under surface of the cap shows that it is composed of thin blades or gills, shaped like a knife blade. At maturity the surface of the gills produces a fine powder known as spores, from which new plants may be produced. Ordinarily, however, mushrooms are propagated by slender threads, called spawn, produced in the soil around the base of an old plant.

Certain species have been cultivated for food for centuries. The industry originated, very possibly, in France. They are raised very successfully in cellars and caves, not because they grow better in the dark, but because these places have a more uniform temperature. Growers claim that it is impossible to raise mushrooms by rule. Of two beds planted side by side under apparently exactly similar conditions, one yields an abundance of mushrooms; the other is a total failure. A writer in Bailey's *Cyclopedia* speaks of succeeding well with a soap box thrust under the bed. In the United States and Canada edible mushrooms grow abundantly in fields and pastures, particularly around stumps. The demand is so great, however, that commercial mushroom raising has become an important industry. They are served like green peas with meat, or made into catsup. They are also canned, like vegetables, and may be had at all seasons of the year. As the poisonous species can be told only with great difficulty from those which are edible, it is needless, perhaps, to say that the uninformed should proceed with the utmost caution, the absolutely safe way being to let mushrooms alone.

Music, as used here, the science or art of combining sounds so that the result is pleasing to the ear. A glance at the word in the dictionary will show that it has half a dozen other meanings as well. A scientific treatment of even this one phase of it is impossible here, but a number of points of general interest may be mentioned. The physical characteristics are noted under SOUND. The origin and early development of music as a science are shrouded in darkness at a great many points. Some students believe that the first music may have been made to imitate the

MASTERS IN THE WORLD OF MUSIC

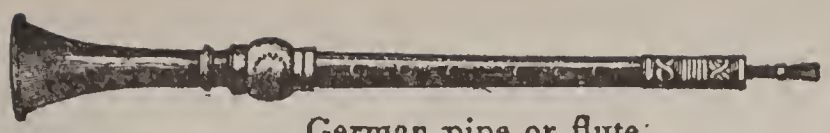
LUDWIG VAN BEETHOVEN

WOLFGANG A. MOZART

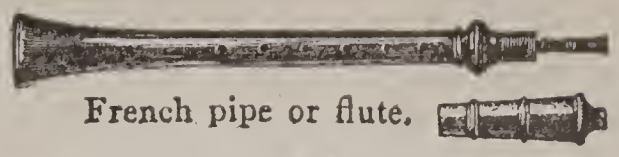
ROBERT A. SCHUMANN

RICHARD WAGNER

IGNACE JAN PADEREWSKI



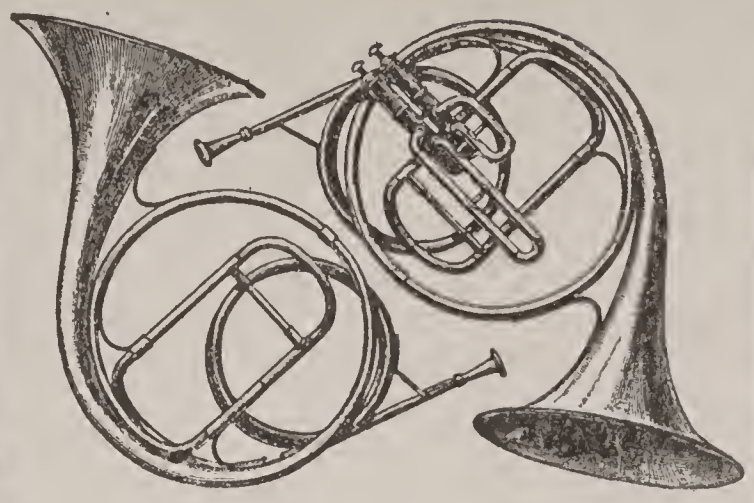
German pipe or flute.



French pipe or flute.

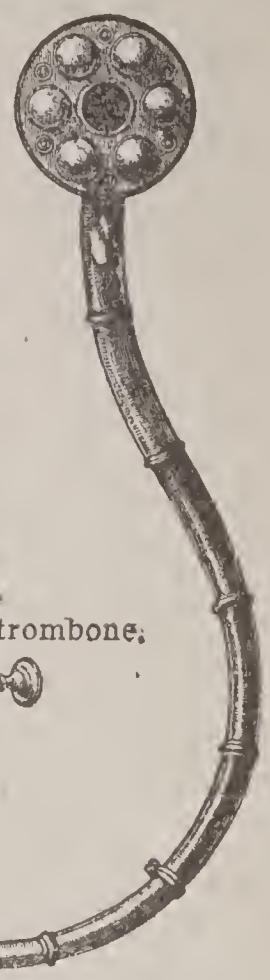
Bassoon.

Oboe.



Hunting horns.

English slide trombone.



Norse lure.

Basset horn.

Cornets.

Chinese instruments.

Ancient Egyptian harp.

Bagpipe.

OLD TIME MUSICAL INSTRUMENTS.

sounds of nature, such as the sighing of winds and the washing of waves; others, that it was the expression of men's religious feelings. The Chinese ascribe it to supernatural beings. The Greeks were probably the first to attempt to apply definite rules to music. Their music consisted simply of melody, or the arrangement of a series of single tones to form an air, and possibly a rough sort of an accompaniment in the bass. In the thirteenth century, counterpoint, the art of composition with two or more related but independent melodies, was originated. Not until the eighteenth century do we find in good form harmony, the "true grammar of music." John Sebastian Bach, Mozart, and other great composers of that period demonstrated that the highest music is written with regard to the principles of harmony. Beethoven with his symphonies marked the height of harmonic composition. Harmony is based upon chords, and deals with their structure, relation, and progression. The simplest chord, the triad, which forms the basis of harmony, consists of three tones sounded together,—the given tone plus its third and its fifth in the diatonic scale. The white keys of a piano or an organ from any C to the C above give the notes of this scale. All modern music is based upon the principles of harmony, and so has a richness and variety not found in the work of the earlier composers. Since early times rhythm, or the arrangement of notes according to accent and time value has formed a necessary element of composition. Today melody, harmony, and rhythm are the three essentials of a musical creation.

Music expresses itself in a variety of forms, each of which is a distinct plan, or design. The simplest of these is the song, the highest the symphony. Others are the opera, the oratorio, the cantata, the fugue, the fantasia, the sonata, and the dance. In all of these except the fantasia, which, as the name implies, is a whimsical, irregular composition, the composer has a definite plan before him. From time to time men have invented the different musical instruments through which to give voice to their compositions. The Chinese believe that at one time China was ruled by a dynasty of spirits, one of the emperors of which invented eight kinds of instruments with the following names: Love the people; The black bird; Don't cut the trees; Cultivate the eight different grains; Chant the celestial doctrines; Celebrate the merits of the sovereign; Imitate the virtues of the earth; Recall the memory of all existing things. Music has been called the "universal language," but as a matter of fact the music of one nation is as different from that of every other as is its spoken language. The German people have given the world its most spiritual music; they could not have done so had not spirituality been a strong national characteristic, for the music of a nation reflects the character and life of its people.

Muscatine, Iowa, an industrial city and the county seat of Muscatine County, is situated on the Mississippi River, and on three railroads, 30 miles southwest of Davenport. The city is built on high bluffs above the river, which here passes in a great bend. It is in a rich agricultural region, and Muscatine Island, below the city, is noted for the size and quality of its sweet potatoes and watermelons. The principal manufactures are buttons made of fresh water clam shells, boilers, canned goods engines, bricks, and tiles, pottery and rolling mill products.

Muscatine has modern schools, the Musser Public Library and a beautiful park. The city owns and operates the water works. In 1920 the population was 16,068.

Musk, a well known penetrating odor. It is considered disagreeable by most people, yet it is employed not a little in the toilet. Commercial musk is obtained from the male musk deer which inhabits the elevated mountain ranges of Central Asia. It is secreted in a small bag or gland about the size of a hen's egg. This the hunters cut off and send to market. The musk deer is about twenty inches high, and is of a dirty brown color. The odor of musk is common to many animals and plants, as is suggested by many names, musk-duck, musk-hyacinth, musk-melon, musk-ox, musk-rat, musk-rose, musk-shrew, musk-tree, and musk-weasel. See CIVET.

Muskegon, Mich., a manufacturing city and the county seat of Muskegon County, is

on Muskegon Lake, which connects with Lake Michigan by a deep and wide channel. It is 40 miles northeast of Grand Rapids, and has good water connections with all important lake ports. It is the largest city and has the largest harbor on the east shore of Lake Michigan. It manufactures automobile engines, school furniture, bowling alleys, office equipment, billiard tables, paper, pianos and talking machines, boats, electric cranes and automobile parts. It was once among the world's most important lumbering cities, but there are no mills operating now.

Muskegon contains an art gallery, a library, a manual training school, a gymnasium, a hospital, a public square, and many bronze statues—all donated by one of her citizens, Charles H. Hackley, and maintained through endowments by him. The population was 36,570 in 1920.

Muskellunge, a large game fish whose general form is that of the common pike. It is usually dark gray on the back, shading to silver grey on the sides; the sides are marked with irregularly distributed round black spots. It often reaches a length of seven feet, and specimens weighing 100 pounds are common in the Great Lakes.

The muskellunge (in the fisherman's vocabulary "muskie") is abundant in lakes Erie and Michigan, and is found in almost all the lakes of the northern United States and western Canada. The muskellunge is a very fine food fish as well as a game fighter. It will take live or artificial bait, and the usual method of catching is to troll from a boat, using a large hook and a short, strong line.

Musket, a smooth-bore hand-gun, with which soldiers were formerly armed. The musket dates from the earliest part of the sixteenth century, having been contrived soon after the introduction of gunpowder. Companies of infantry were at that time divided into pikemen and musketeers. The first musket was a heavy affair. The soldier laid it at rest in a crotched stick and fired it off by means of a burning brand or punk. At a later date the musket was supplied with a steel hammer worked by a spring and a piece of flint held in a clip in such a position that the descending hammer struck off sparks into a pan of exposed powder or priming. The percussion cap with an inner lining of fulminate is a still later invention. By degrees the musket was made lighter, so that it could be carried with some sort of comfort by a single soldier; although pictures of Miles Standish represent him as still requiring a rest for his matchlock. Smooth-bore muskets were obtained by our Revolutionary soldiers from France. In 1895 the government established the manufacture of muskets at Springfield, Massachusetts. The old smooth bore was used in many regiments until the close of the Civil War. This weapon has now been universally displaced by the rifle. See FIREARMS.

> And is it I
> That drive thee from the sportive court, where thou
> Wast shot at with fair eyes, to be the mark
> Of smoky muskets?
>
> —Shakespeare, *All's Well,* etc.

Muskmelon, a member of the gourd family allied to the cucumber. Muskmelons of fine flavor are raised from Italy and Egypt to Persia, but the summers of Germany and England are too cool to ripen them. In this country New Jersey is the banner muskmelon state. Entire farms are given to their culture for the markets of the large Atlantic cities. Two types are in general cultivation—the cantaloupe, with hard, furrowed rind and yellow flesh; and the nutmeg, with softer, netted rind and greenish-yellow flesh. Of late, muskmelons have been shipped long distances in crates. In 1904, 1,182 cars of crated cantaloupes were shipped eastward from Rocky Ford, Colorado. For the total American yield of muskmelons, see VEGETABLES.

Muskogee, Okla., an industrial city and the county seat of Muskogee County, is 130 miles east-northeast of Oklahoma City, and on several railroads. It is surrounded by agricultural and stock raising land, and is near valuable coal oil and gas fields. Chief among its manufactures are hardware, mattresses, oil well supplies, agricultural implements and cotton goods; and there are corrugated iron and steel works and oil refineries.

Muskogee contains the Bacone Indian

University, St. Joseph's College, Oklahoma State School for the Blind, Federal Hospital tor Disabled Soldiers, fine public schools and a Carnegie library. In the vicinity are Fort Gibson and a national cemetery. Muskogee is the headquarters of a government Indian agent. Population in 1920, 30,277.

Muskoka Lakes, a chain of beautiful Canadian lakes in northwestern Ontario; the lake region is bounded by the Parry Sound district, north; Haliburton, east; Simcoe, south; and Georgian Bay, west. There are from 800 to 1,000 lakes in the Muskoka district, and their location in the picturesque Laurentian Highlands adds to their attractiveness. These hills are covered with pine, hemlock, maple and balsam.

The lake from which the name of the chain is derived — Muskoka Lake — is the largest of the group, having an area of 54 square miles. It is 20 miles long. The beauty of the region is heightened by several waterfalls. The most notable, the Bridal Veil Falls, are on the Shallow River. On the Muskoka River are South Falls and High Falls, and on the Skelton River are Skelton Falls.

The Muskoka Lake district is served by the Canadian Pacific, the Canadian Atlantic and the Grand Trunk railroads. Few places in North America offer more attractions to the seeker for quiet and rest in the presence of great beauty. Thousands of Canadians and Americans visit this region each year, and its popularity is growing. Muskoka is also becoming well known for its tuberculosis sanitaria, and the number of persons seeking health bids fair to rival the number of those seeking rest and quiet.

Musk-ox, a cud-chewing mammal, intermediate between the ox and the sheep, formerly found in all arctic countries. It is now confined to the northern part of British America. Both sexes are horned. It is somewhat larger than the Rocky Mountain sheep, to which it bears a strong resemblance in fleetness of foot and general hardiness. The body is draped with long, fine hair. The musk-ox takes its name from a secretion of the body.

Muskrat, a large representative of the mouse or rat family. It takes its name from its musky odor. It has an appearance midway between that of a large rat, which it resembles anatomically, and the beaver, to which the fur and a flat, bare tail have no little resemblance. The muskrat is naturally an inhabitant of cold regions. The farther north it lives, the better its fur. It makes considerable journeys on land, but its native home is in the reedy edge of a lake or river bayou. It constructs long burrows leading from under water in the pond, up into the bank, where its young are usually brought forth. Conical piles of reeds, grasses, and moss are built up from the bottom of the pond to a height of from one to six feet above the water. Passages lead from the bottom up through the house to interior chambers, sometimes one, sometimes several in the same house. Each chamber has two passages,—one of easy grade up which the muskrat ascends, the other almost perpendicular down which it plunges when it desires to leave its nest. The muskrat lives chiefly on the roots of water plants. It is active all winter. When the long outer hairs are pulled off, the fur of the muskrat is very fine, soft, and thick Now that the beaver is so scarce it is in increasing demand. The North American trapper receives from four to twenty cents a pelt according to season and size. In 1910 the price for prime skins was advanced to seventy-five cents.

Muslin, a general name for plain-woven cotton cloth. The name is derived from the French mousseline, which, in turn, is thought to be from the name of the Turkish city Mosul. Like many other cotton goods, muslin originated in India. The India muslins, light, airy and fine, were introduced into Europe during the seventeenth century. Until the invention of the mule-jenny the cotton yarns spun in England were of too coarse a grade to produce satisfactory muslins. With the mule-jenny finer yarns were spun, and, by 1793, English muslins were produced equal to those imported from India. Until the latter half of the nineteenth century the word muslin denoted specifically a thin, light, semi-transparent fabric, such as is now designated by the word lawn. At present muslin, as commonly used, denotes a strong, close-woven fabric, put out both bleached and unbleached, used for underwear and a great many other purposes. See SPINNING; COTTON.

European hedgehog.

Tube-nosed jumping mouse.

Malayan squirrel shrew.

Madagascar hedgehog.

Russian muskrat.

INSECTIVOROUS ANIMALS.

Mussel, a bivalve closely related to the oyster, the clam, and the cockle. The distinction between clams and mussels should be observed. The most prominent outward difference is the way in which the two valves of the shell fit together. When the valves of the mussel are clapped together, the edges meet closely all the way around. In case of the clam, a sinus or rounded opening may be seen near one end of the hinge. This opening is filled by the siphon or "neck," of the animal when living. When the shell is empty this sinus is open even though the shell be closed. The mussel may be told from the clam and the oyster, also, by its habit of traveling on a foot, like that of a snail, put out between the thin edges of the shells. By examining the sandy bottoms of clear ponds one can see the narrow furrow made by mussels as they shuffle along at a "snail's pace."

Clams are animals of the salt flats. Mussels are of two sorts—marine mussels and fresh water mussels. Fresh water mussels are familiar to every resident by a river or pond. It is considered that they are descendants of salt water species; that they have worked their way up river from the sea, and have adapted themselves to a fresh water life; or that they were retained when the land rose from the sea and the salt waters ran off to the ocean These mussels, like clams and oysters, have soft bodies compressed into the form of an almond. The head is undeveloped; and it is without tentacles or eyes; the mouth has no horny jaws or salivary glands; the gills consist of numerous filaments grown into large plates; the heart consists of one auricle and two ventricles; the nervous system consists chiefly of three pairs of ganglia situated in the head, the foot, and the digestive tract.

It is doubtful whether the mussel can smell or hear. A fold of skin or body wall proceeding from a line along the back laps over on each side of the animal like a cloak. The edges of this fold meet along the ventral surface. While the mussel is yet a tiny creature the exposed surface of this fold secretes a limy substance and covers itself with a protection known as a shell. A portion of the fold lying along the back remains soft and forms a hinge. The inner, pearly surface of the shell is fed by the part of the fold to which we give the name of mantle. The shell grows around the edges, and increases in size to keep pace with the growth of the soft, defenseless body within. Strong muscles, called adductor muscles, draw the valves of the shell together so stoutly that a raccoon cannot open them. When these muscles relax, the valves fly apart on account of the hinge, which is elastic and is compressed—crowded—so long as the valves are held together. As the shell grows the point of attachment of these muscles shifts with the attachment of the mantle toward the edge or lip.

The ventral portion of the body is strongly muscular. When the shell opens, a wedge-like muscular projection of the body, known as the foot, reaches out and begins to plow along through the sand and mud. In boating over quiet shallows where these mussels live the furrows may be traced by the eye for many yards. Not infrequently, the position of the mussel, which bears a strong resemblance to a stone on the bottom in which it lies half buried, is betrayed by a furrow lately made. The food of the mussel consists of minute plants and animals which are wafted into the soft mouth by the ciliated gills. The stomach is provided with digestive juices. Toward autumn the mussel compacts a store of food into a crystalline substance which it stores in the stomach for winter use. Less solid material contained in the intestine is drawn upon also to tide over the winter. It is but frank to say that as yet investigators are not quite sure about this food supply.

Toward autumn eggs are squeezed out of an organ in the "foot" and are conveyed to the gills, where they are carried until each is developed into a tiny creature having, indeed, no foot, but protected by two delicate triangular valves. Each valve is provided with a hook; glutinous threads —anchor ropes—hang from the spot where the foot is to grow later. At this stage the parent ejects the young to anchor where they may. If the anchor thread touches a fish as it comes nosing by, the young creature clings on, strikes its two hooks into the surface of the fish's gill or skin, possibly at the root of a fin or near the tail. A diseased growth of the fish's skin surrounds the young creature and protects it

until it is ready to drop to the bottom of the pond and begin life on its own foot. The fish thus plays an important part in the life of the mussel. In rivers it prevents the embryo mussels from being carried by the current out to sea. It carries the young from place to place and increases the range of the species. Whether mussels necessarily perish where there are no fish is a question that awaits demonstration. See CLAM; OYSTER; PEARL; BUTTON.

Musset, mü-sā′, **Louis Charles Alfred de** (1810-1857), a celebrated French poet. His father was a man of letters, and the son grew up with a strong taste for literature. He tried various professions, but decided at last to devote himself to a literary life. His first volume of poems, *Tales of Spain and Italy,* was published in 1830. Musset was the author of many poems, some of them ranking among the finest in the French language. He also wrote novels and several dramatic works. Irregular and dissolute living destroyed his health. He became morbid and melancholy. The autobiographic novel, *Confession d'un Enfant du Siècle,* contains the analysis of a diseased mind.

Mustang, a general name for the wild horses of the pampas and prairies. They are descended from horses brought to the New World by the Spaniards. The term mustang is used chiefly from Mexico southward among Spanish-speaking people. In the Northwest mustangs are known as Indian ponies or broncos. The name cayuse (ki-ūs), also in use, belongs properly to the ponies of the Cayuse Indians of the northern Rocky Mountains. Broncos are tough, wiry horses of small size. Bronco "busting," or breaking to the saddle, is an operation in which the cowboy takes great pride. The animal is caught with a lasso and thrown to the ground, a saddle is strapped on its back, the rider takes his seat, and the wild, thoroughly terrified animal is given its head. It usually springs to its feet and attempts to throw its rider by every possible trick, especially by "bucking" or leaping into the air and coming down on all four legs held stiff. It rears, it plunges, falls down, rolls over, and attempts in every way to dislodge its rider. Once broken in, however, a bronco is a valuable saddle animal, able to subsist on scant forage and to carry its rider with a tireless lope for hours at a time. It was much employed in scouting, and for cavalry mounts, and has long been a favorite herder's horse. Broncos are broken to the harness as well, but seldom become entirely gentle.

Mustard, an herb belonging to the same family as the horseradish, turnip, rutabaga, radish, shepherd's purse, and pepper-grass. The white mustard and the black, the most commonly known species, are both from Europe. Table mustard is obtained by grinding the seeds of the black mustard. Flour of mustard is obtained by hulling the seed and rejecting the bran,—though with loss of strength. The production of table mustard has assumed large proportions. Natural scenery, both in Great Britain and in America, is defaced by huge lettered signs proclaiming the virtues of some particular brand of table mustard. Mustard is a pest in the great wheat fields of the southwest, where, once established, it perpetuates itself, until weeded out or destroyed by summer fallow. A solution of copperas, sprinkled on the top of the mustard when it is about eight inches high, and before it blooms, destroys the plant. Seventy-five cents for material and labor covers the cost of spraying an acre. Grains and grasses seem to receive no injury from the spray; but turnips and radishes, both of which are members of the mustard family, are injured and destroyed quite as readily as the mustard itself.

Mutation, in plant and animal breeding, the theory that new varieties and species arise without intermediate forms. Darwin taught that new forms are evolved slowly; according to the mutation theory they come at a jump. The father of the mutation theory is Hugo de Vries, professor of botany in the University of Amsterdam. He began experiments in 1886 with common toadflax, the irregular "butter and eggs" of the wayside. One side of the corolla is spurred. A fold in the corolla closes the throat. Noting an occasional flower with a five-spurred corolla, De Vries set to work to see what he could do toward producing a five-spurred toadflax. He removed to his garden the roots of a few plants that had been observed to bear a five-

spurred blossom or two. The seeds of these plants were saved and planted. Omitting accounts of pollination, in the third generation he had a plant that produced as usual many flowers, one of them a five-spurred flower. Seeds from this plant only were sown. In the next generation, the fifth, there were two plants with a five-spurred flower or two. Seed from these only were saved. In the sixth generation, all the flowers were plainly one-spurred. No progress had been made seemingly. In 1894, however, there were scattering peloric flowers on eleven different plants, and there was one plant bearing five-spurred flowers only. *This plant and its descendants continued to bear five-spurred flowers only.* De Vries in this way established a new variety of toadflax, and it came, not by a gradual change, but at a leap, and De Vries was there to see it.

Extended experiments were conducted by this distinguished botanist with other plants, notably the common cornflower or cornmarigold of Europe. Observing that the florets in the ring around the head varied in number, he undertook to produce corn-marigold with heads covered with florets. Out of three hundred plants, he selected six whose heads bore on an average twenty-one florets. The seeds of each were sown in a plot, and two of the best plants in the best plot were selected—best in this case meaning the plants whose heads averaged the greatest number of florets. Proceeding year by year, in 1897, the number of rays suddenly began to increase by leaps, 21, 34, 48, 66, the florets scattered over the disk; 100, 200, in a word a completely double variety had been produced, practically at a jump.

De Vries has taught that we may expect sports to appear suddenly, and that by watching for them and by caring for them, we may obtain new varieties and new species. De Vries conducted experiments, also, with Lamarck's evening primrose. He sums up his theory of mutation or change as follows:

1. New elementary species appear suddenly without intermediate steps.
2. New forms spring laterally from the main stem and leave the old species to go on in the same old way.
3. New elementary species attain their full constancy at once. Constancy is not the result of selection or of improvement. It is a quality of its own. The tendency must be present in the old species as the tendency to produce five spurs or double flowers. It cannot be forced, if wanting. It needs no help, only a chance, if present.
4. Some of the new strains are species; some merely varieties.
5. The new species and varieties may be obtained again and again by repeating conditions.
6. Mutation is not mere variation. It is the establishment of a new center, an independent new type.
7. Mutations take place in all directions. The new types may be larger; they may be smaller; they may be stronger; they may be weaker; they may be more brilliantly colored; they may be duller in color; they may be better suited to the life to be led; they may not be so well suited as is the parent species. It is as though the species were sending out colonies, making experiments in all directions.

The theory of mutation is quite in harmony with the observations of gardeners. The parent of Ephraim Bull's Concord grape was a wild grape. Bull simply took care of the sport. John Adlum found the Catawba grape growing wild in the woods of Buncombe County in extreme western North Carolina. It was simply a mutant, a sport. The Clinton arose from a vine planted in the grounds of Professor Noyes of Hamilton College. A number of domestic plums are mutants of wild plums, that is to say, they have not been improved gradually. They have appeared all at once. The Deering gooseberry, to quote Bailey, "is the standard of excellence in American gooseberries, and yet it is only two removes from the wild species." New forms are obtained by crossing or hybridizing, but the leading varieties of our domestic fruits are mutants—voluntary sports—but sports that have been taken care of, and not allowed to be lost.

See BURBANK; DARWIN.

Mutiny, a rising of soldiers or sailors against a lawful officer. To join a mutiny,

or to incite an insurrection among soldiers or sailors, is a serious offense. The laws of the United States provide that a soldier guilty of the offense shall be tried by court-martial and shall suffer death or such other punishment as the court may determine upon. A mutiny among seamen being regarded as a still more serious affair, death alone is the penalty. The laws of Great Britain are similar. In Russia the power of summary punishment is lodged in the hands of superior offiecrs. Soldiers or sailors guilty of disobedience, not amounting to mutiny, may be put to death, even without the formality of trial. See SELKIRK.

Mutsu Hito (1852-1912), Emperor of Japan from 1867 to 1912, was born at Tokyo. In 1867 he succeeded to the throne and in the next year instituted the first of the reforms that endeared him to his subjects and won the respect of other nations; his first reform was the overthrow of the office and power of the Shogun, who for 700 years was the *de facto* ruler of Japan. From 1868 to 1889 Mutsu Hito was theoretically an absolute monarch, but in fact he was a very enlightened and competent constitutional ruler. During his reign and due very largely to his influence, Japan made phenomenal progress; and in 1889 a national constitution was promulgated.

Mutsu Hito, during his reign, spared neither effort nor money to advance the interests of his subjects, and upon his death in 1912 the empire went into deepest mourning. In 1913 the posthumous title of "Meiji Tenō" (Emperor of the Era of Enlightment) was formally conferred upon him.

Mutton, the flesh of sheep, raw, or dressed for the table. Raw mutton is light red in color, the fat being pure white. It has a characteristic odor. It is on the whole a lighter food than beef, not so well fitted to supply the strength necessary for great exertion but more easily digested by a delicate stomach. According to the results obtained by students of dietetics, mutton and lamb form 1.4 per cent of the food of the average American family.

Myrmidons, in Grecian legend, a warlike people of Thessaly. They were the descendants of Myrmidon, a reputed son of Zeus. The name means ants. According to one version Zeus created the Myrmidons by transforming ants into men. Their warriors accompanied Achilles to Troy.

Myrrh, mer, an aromatic resin much prized by the ancients. The myrrh tree is a thorny shrub from ten to twelve feet in height, with a light gray bark, having the general appearance of the hawthorn. It grows in dwarfish thickets on the sunny slopes of the Levant, especially in Arabia, although it is found eastward as far as Bombay. Myrrh is obtained also from Somaliland on the coast of eastern Africa. The natives bruise the bark of the tree with a stone to encourage the formation of the gum. Like spruce and other gums, it exudes from cracks in the bark and hardens in the form of tears. When dried it has a reddish brown color. Myrrh was formerly much used in the making of ointments and perfumes. It was one of the precious gifts presented by the three wise men to the infant Christ in the manger. It was in great demand among the Egyptians for the embalming of bodies. Joseph, it may be remembered, was sold to a caravan of merchants on their way to Egypt with myrrh and other precious merchandise. See GUM; PERFUME.

Myrtle, a family of aromatic plants. There are about one hundred species, mostly shrubs. The common myrtle, the myrtle of the ancients, is a handsome evergreen shrub native to the Mediterranean Sea. It grows from three to ten feet high. The leaves are aromatic. The flowers are white; the berry black. It was sacred to Venus, and was used largely for decorations in the festivals given in her honor. The myrtle is the symbol of youth and beauty. The berry and leaves were used formerly in medicine. The bark was used also in tanning. It has been introduced as a lawn and garden plant in the warmer parts of the world. It makes an excellent hedge in Florida. In southern California it blooms the year around.

Mystery. See MIRACLE PLAY.

Mythology, mĭ-thŏl′ŏ-jy, the whole system of traditions and legends which embody

the primitive beliefs of a nation concerning its origin, its founders, its heroes, and its religion. The word mythology comes to us through French and Latin from two Greek words, *muthos,* a fable, and *logos,* from *legein,* to tell. The Greek word for fable, it must be remembered, had the significance of narrative and not that of our word fable. Mere fairy stories or fables designed for amusement or instruction have no place in mythology. Genuine myths represent the beliefs of the people. Zeus, Apollo, Athene, and Heracles were as real to the Greek people as George Washington and Benjamin Franklin are to the American. The Grecian youth was taught that Vulcan was flung from Mount Olympus, and that he fell all day until he alighted on the Isle of Lemnos, quite as the American schoolboy is taught the story of the cherry tree and George Washington's famous hatchet.

The words, myth and legend, are used frequently as synonymous terms, but the collective word mythology includes the traditions of the gods or other supernatural beings, while the legends of a people may embody only such tales as lack sufficient evidence to make them acceptable as history. It is the province of the science of mythology to investigate the origin of these myths and traditions. There are certain myths that need no explanation. That the dawn should be personified as a bright-haired goddess, that the rainbow is the many-hued robe of the fair Iris, that the Sun-god drives his chariot daily through the sky, that the forest is guarded by a "huntress chaste and fair" are beautiful and natural stories.

But quite different are the weird tales of the origin of the earth, of men, animals, and the objects of nature; the accounts of impossible monsters; the stories of the jealousy, injustice, dishonesty, and cruelty of the gods, and of gods and men being changed into beasts or rivers or trees or stars; the repulsive descriptions of Hades; the descent of heroes into this lower world and their return. The need of an explanation of such myths as these was felt at an early period. Six centuries before the Christian Era, Greek philosophers began to express doubt and disbelief in the myths of the gods. They criticized Homer and Hesiod for ascribing to the gods so much that was evil, as stealing, deceit, adultery, and cruelty. Heraclitus (535-475 B. C.) is said to have declared that Homer deserved to be ejected from public assemblies and flogged. Anaxagoras (500-428 B. C.) tried to explain the Homeric stories of the gods as allegories. Politics and religion being somewhat mixed at this time, he was thrown into prison in consequence. His views, none the less, show the tendency of philosophic thought in his day. Protagoras (481-411 B. C.) declared that nothing could be known as to whether the gods existed or not. Plato stated that though many a myth had symbolic meaning, the Homeric poems should be banished from his ideal republic. We find Greek poets also, Aeschylus, Pindar, and Euripides, expressing doubts concerning the gods, noting the inconsistencies in various myths, and making such statements as "it is evil wisdom to speak evil of the gods," and "if the gods commit anything that is evil they are no gods."

Although as civilization advanced the early myths were thus discredited and speculations put forth as to their origin, it is only during the nineteenth century, since the science of comparative philology has led to and aided in the study of comparative mythology, that real progress has been made in explaining the origin of myths. The theories worth considering are as follows:

1. The Ethical Theory. According to this view the old myths were invented by the wise for the moral betterment of those whom they desired to teach. It is easy to accept this explanation concerning stories which represent the gods as rewarding the good, punishing the wicked, and setting constant examples of virtue; but when we read of the god Cronus swallowing his own children, of Apollo flaying Marsyas alive, of Juno flinging her child out of heaven because he was born with a twisted foot, we begin to realize that the ethical theory is inadequate.

2. Historical Theory. Those holding to this theory maintain that all personages mentioned in mythology were once real human beings; that the fabulous elements, the impossible and supernatural, are the additions of a fanciful people, enthusiastic in decorating the tales of their heroes and

in inventing and imputing evils to their enemies. As an example of the application of this theory Aeolus may be cited. The story goes that he was once a man, the ruler of some island in the Tyrrhenian Seas. He taught his people the use of sails for their ships, and to foretell the changes of winds and weather from atmospheric conditions. Later, Aeolus was deified as God of the Winds.

3. Physical or Allegorical Theory. According to this theory the inventors of myths designed to teach the facts of nature as well as moral and historical truth; that the gods were really the winds, sun, stars, moon, fire, earth, and water; that in the story of Io, for instance, Io is the moon, the hundred-eyed Argus is the starry sky who keeps sleepless watch over her. The wanderings of Io, then, are the revolutions of the moon. At this point the explanation ceases to explain; for in the old story Hermes slays Argus and it is only then that Io begins her wanderings. According to this theory, Hercules is the all-conquering sun, and Hermes, of the winged sandals, is the wind.

4. The Scriptural Theory. The supporters of this view aim to find a counterpart in Biblical story for the myths of nations other than the Hebrew, maintaining the Biblical stories to be the true accounts and the myths of other nations to be distorted forms. For instance, the myth of the golden apples in the garden of the Hesperides is the story of the garden of Eden. The dragon who guards the apples is the serpent who tempted Eve. The story of the Deluge finds its counterpart in the Greek legend of Zeus destroying mankind by flood, where Deucalion takes the part of Noah. Hercules in Greek mythology is the Samson of the Bible story. Arion is Jonah. The attempt of the giants to storm heaven finds its counterpart in the story of Nimrod's tower, "whose top may reach into heaven."

5. The Philological Theory is of interest to us chiefly as it has presented a new method for the study of mythology. The discovery that various languages are related led to the comparative method of the study of etymology. It led also to the comparative method of studying mythology; for it was soon learned that the mythologies of kindred races are related to a greater or less degree. Philology teaches us that the following names from five different languages are from one original source:

Zeus ..... Greek
Dyaus (a god of the Hindus) ..... Sanskrit
Ju(piter) (piter=pater or father) ..... Latin
Tiw (in Tiwesdaeg, Tuesday) ..... Scandinavian
Zio ..... Old High German

Here we find Zeus, the most sacred name in Greek mythology, identical with Dyu (root of Dyaus) with Jove or Ju, with Zio and with Tiw (Anglo-Saxon), or Tyr, a Norse god. It is interesting to note that the word deuce of English slang is from the same root. While the original meaning of Zeus in the Greek language is lost wholly, in Sanskrit Dyu meant sky; we may infer therefore that each of these five words meant sky. So other names found to be related may be traced in some one language to their original meaning. By this method of study, many facts have been learned which throw light on the origin of myths, although they cannot clear up all difficulties. By this method, Max Müller arrived at his "philological theory" that "the silly, savage, and senseless" element in mythology is a result of a "disease of language"; that is, that words finally lost their original significance. The fact that Zeus meant sky, for instance, by a gradual personification of the word, was at last forgotten utterly. It will be seen that there is a point of resemblance between this theory and the physical or allegorical theory. According to both, myths have their origin in the personification of some natural object or phenomenon. But the physical theory suggests that in each case the myth was invented with a conscious purpose, while the philological theory accounts for it as an error or weakness in language whereby the original phenomenon is lost sight of in the personification. Doubtless there is truth in the philological theory; but it is incredible that all myths should be accounted for in this way.

6. The Anthropological Theory. Still another class of scholars making use of the philological method of study, but uniting with it a study of primitive man, not only as he existed in the early stages

of civilized races, but as he exists today among barbarous and savage tribes, has developed a theory called sometimes "the historical" but more exactly the anthropological theory; that is, a theory based upon the nature of man. Andrew Lang is the most prominent advocate of these views. Simply stated, this theory is that these strange and irrational myths have their origin in the *"condition of thought"* through which all races have passed or are passing. Curiosity and credulity are the characteristics of the savage. He observes the objects and phenomena of nature. He asks why these things are as they are. A story, however "silly" or "senseless," satisfies him. If none is given he may invent one himself. Naturally enough these stories are in accordance with savage notions of personality, of life, of death, and of nature. It has been proven clearly that savages regard animals as physically akin to themselves, endowing them with the power of thought, and, in some cases, of speech. The institution called totemism found among many savage nations is the belief that the various families or stocks are descended directly from different animals. As an outgrowth of this, perhaps, certain men are supposed to have the power of becoming animals at will. Moreover, savages regard inanimate objects, especially those connected with the phenomena of nature, as possessing personality. To them sun, moon, stars, water, wind, fire, the sea, the earth have the attributes of human beings, and of *savage* human beings; for these primitive people know no other kind. As to death, most savage races regard man as naturally immortal, and some myth tells how a sin or an error like Pandora's curiosity brought "death into the world and all our woe." The savage compares death to sleep. He knows that, while his body is quiet in sleep, he may in dreams be far away. When he sees his dead friend for a brief moment in a dream he believes, naturally enough, that his friend has returned but cannot stay. Whatever is clearly allegorical in ancient myths must, according to this theory, have been added by later peoples who had reached higher and purer ideas but could not yet give over the religion of their ancestors.

The anthropological theory, it will be seen, accounts for the beginning of myths. The five other theories may one and all be of value in accounting for their growth and development, and for the fact that we find the same story with slight variations among different tribes of the same nation. The science of mythology has, as yet, investigated the traditions of a few nations only. Among those which have been studied, the most interesting are mythologies of the Egyptians, Hindus, Persians, Grecians, Romans, Scandinavians, and American Indians.

EGYPTIAN MYTHOLOGY is of a complex character and, for the most part, obscure. In the writings of the ancient Egyptians, scholars have found the evidence of a belief in one supreme God, creator of heaven and earth. This idea is, however, confused with polytheism of a low and materialistic sort. The Egyptians appear to have held that the heavenly abyss was the abode of the supreme god who there produced sun, moon, stars, and all other gods. At other times the abyss itself seems to have been worshiped. There is evidence also that sun worship was the most primitive form of religion. It must be remembered that a religion or mythology, lasting through some five thousand years and expounded by many different schools of priests, must have undergone many changes and can hardly be viewed as a single system. This we know, that the Egyptians, although they reached a high state of civilization, although their priests were scholars and scientists and their temples among the wonders of the world, worshiped an immense number of gods in the shape of animals—a form of worship found among the lowest and most barbarous races. Osiris was the principal deity. He was called the Good Being, the Lord of Life, the Great God, the King of Eternity, the God of the Nile, the Judge of the Dead, the God of the Sun, and many other names. He was supposed to be in constant warfare with his brother or son, Set or Seth, the god of evil, of darkness, and of the desert. Osiris was worshiped in the form of the bull, Apis. The story, told somewhat incompletely by the Roman Plutarch, is that Osiris, who with his wife, Isis, had descended to earth in human form to teach and aid

mankind, was slain treacherously by Set, whom Plutarch calls Typhon, from the Greek Typhon. Thereafter the soul of Osiris passed into a bull. The god is also represented as a mummified human figure. Ra, another important deity, was the chief sun-god. He seems to have been regarded as the sun in mid heaven, other names being used for the sun at its rising and at its setting. There is a myth that Ra once destroyed mankind under circumstances reminding one of the deluge. Each Egyptian town appears to have had its cycle of gods, usually nine in number. The cycle was explained as the self-development of Ra. The most important cycles were those of Memphis and Thebes. The unification of these various cycles is responsible, doubtless, for much of the obscurity and confusion that renders Egyptian mythology so difficult. Each city regarded some animal as sacred. The crocodile, the ape, the jackal, the lion, the cat, almost every beast and reptile, found worshipers in some locality. No man might eat of the flesh of the animal held sacred in his district, but might partake freely of such animals as his neighbors worshiped. The Egyptian temple was dedicated to three gods in one. The first represents the male principle, the second, the female principle, and the third, the offspring of the other two.

The Egyptians embalmed their dead, placing in each tomb a scroll or papyrus containing directions for the soul on its journey. This papyrus was called the "Book of the Dead" or "Ritual." "The Book of the Dead" constitutes the oldest literature in the world. The soul followed this ritual until it reached the hall of Two Truths, where it was judged by Osiris and forty-two assistants. If it was judged righteous it entered the boat of the sun and was guided to the home of the blest. The belief also obtained that after three thousand years the soul might enter its old body and begin life anew. The wicked died a second death or passed into endless misery.

HINDU MYTHOLOGY is to be found in certain portions of the Veda, a collective name for the sacred writings of India. The Veda consists of four Vedas and Brahmanas, with compendiums of rules, commentaries, etc. It is not to be supposed that so voluminous a body of writings was produced at any one time; but the date of no part of the work has been ascertained with accuracy. Scholars place the oldest, the Rig Veda, usually about 4000 B. C., and state that the most recent writings cannot be dated later than the second century B. C. The Vedas themselves consist mainly of hymns from which much may be inferred as to the prevalent ideas of worship, but which, of course, do not contain myths properly speaking. The Brahmanas are especially for the direction of ritual and sacrifice. They are full of mythical stories of the adventures of the gods who possess all the vices known to human beings, as well as magical powers, including the ability to transform themselves into animals or inanimate objects. The Upanishads, a species of commentary attached to the Brahmanas, propound theories concerning the creation and the nature of the human soul.

One Hindu view of the creation, found also among many other primitive peoples, is that at one time water held all life in solution. From this in some way is produced a great egg from which the universe emerges. Or the Lord of Creation emerges from the egg and makes the world himself. Another view presented in a Vedic hymn is that the world is a covering for divinity. In the Laws of Manu, a sort of book of laws recast from certain parts of the Veda as a manual for a particular class or school, a "self-existent Lord" is mentioned who "with a thought created the waters and deposited in them a seed." This seed develops into a golden egg from which "he himself is born as Brahma, the progenitor of all the worlds. In the earliest accounts thirty-three gods are mentioned. Later the number increased to over three thousand. They may be classified as deities of light, of air, and of earth. "The Shining One," the sky god Dyaus, holds a prominent place in Hindu mythology. Like other deities of India who personify natural phenomena, the sky god seems to retain both in name and attributes the original significance of his title. Indra is the thunderer; Agni, the god of lightning and fire; Vayu is the wind; Ushas, the dawn. One of the myths told of Indra has reference to his fondness

for soma, an intoxicating drink. He once found some soma juice which had been prepared for another. Indra partook of it until he fell ill. Then he saw that what was left had become his enemy Vrittra, the serpent. Indra immediately cut Vrittra in two and of one-half made the moon. The gods are represented as subject to death, although one and another finds some way to avert the calamity and to become immortal. The belief that, after countless existences as animals and men, the soul is at last absorbed by the supreme being, is a belief of such antiquity among the Hindus that its origin can not be discovered. With Buddha, five centuries before Christ, came the idea of Nirvana, which means practically extinction. Hindu beliefs concerning Brahma, the caste system, and the transmigration of souls belong rather under the head of religion than of mythology, since they still hold sway in India. See VEDA; BRAHMINS; TRANSMIGRATION OF SOULS; BUDDHA.

PERSIAN MYTHOLOGY. The ancient Persians believed in one supreme being, and their worship seems to have been notably free from superstition. In the course of time this pure religion became corrupted. Many gods were recognized, temples built, images set up, and worship was conducted with various weird ceremonies. About 1500 B. C. Zoroaster arose. He came to be regarded as a reformer and founder of the later religion, which is more or less confused with the earlier traditions. The teachings of Zoroaster are set forth in the Zend-Avesta,—the word Zend, meaning "comment," and Avesta, meaning "text." The Zend-Avesta consists largely of hymns. These hymns seem to teach belief in a supreme being who created two other powers, Ormuzd or Oromasdes, the "Great Life-Giver," who remained faithful, and Ahriman, who rebelled and became the "Dealer of Death." Ahriman seems to have been regarded at times as self-existent, and Ormuzd himself as the supreme being. Ormuzd "gave the earth, he gave the heavens, he gave mankind, he gave life to mankind." All good comes from Ormuzd; all evil from Ahriman. Among minor gods Mithras, the sun god, is most important. Homa or Soma is the moon god.

The hymns of the Zend-Avesta show traces also of a form of worship in which the powers of nature, wind, fire, light, are worshiped as powers, not as personifications. Mankind was created in innocency, but was tempted to sin by one of the Devas, lesser evil spirits. Thereafter each human being must choose whether he will serve Ormuzd or Ahriman. At death the good were taken to "the House of the Angel's Hymns;" the wicked to the "Abode of Demons." The "Bridge of the Gatherer," which only the righteous can cross, is between these two abodes. The Persians believed in a general resurrection, after which Death is to be slain and Life in righteousness will continue eternally.

GREEK MYTHOLOGY. In Greek mythology, mingled with stories and legends of poetic beauty, we find much that is savage and debasing. The worship of rude stones, or of hideous images representing the gods with repulsive deformities; the revolting rites and wild orgies of the religious festivals; the offering of human sacrifices, seem incomprehensible when we consider the high civilization of this nation and its marvelous achievements in art and literature. That, when these myths arose, the nation was still in that phase of "savage thought" which Mr. Lang describes, seems the only explanation which even approaches the difficulty.

The Greek ideas of the creation of the universe are vague and obscure. One story states that Erebus and Nox produced an egg from which Eros, the god of love, emerged. Eros created Uranus (Heaven) and Gaea (Earth). Being god of love, Eros persuaded them to marry. Their children were the Titans, one of whom, Prometheus, created man in the image of the gods, fashioning him from earth mixed with water. Two of the Titans, Ophion and his wife Eurynome, were the first rulers of the gods. Cronos dethroned Ophion and reigned with his wife Rhea during the Golden Age. Cronos was warned that one of his sons would succeed him. To avert this, he swallowed his children as soon as they were born. When Zeus, the youngest, was born, Rhea substituted a stone for the child which Cronos swallowed unquestioning. When Zeus was grown, he persuaded

his father to partake of a certain draught which caused him to disgorge his children. Then, with his brothers, Poseidon and Hades, Zeus overthrew Cronos and reigned in Olympus. Poseidon received the ocean as his share in the division of the spoils and Hades (Latin, Pluto) the lower world.

The Greeks believed the earth to be a flat disk with Mount Olympus in the center. The higher or greater gods, of whom there were twelve, moved usually in the upper air above the clouds. They were accustomed to assemble in council on Olympus and are often mentioned as the Olympian gods. The inferior gods dwelt far below. A demigod was the offspring of a god and a mortal. At death the immortal part was received among the gods. The sea (the Mediterranean) was supposed to divide the earth from east to west, while the River Ocean flowed entirely around it. On the northern part of the earth, beyond the mountains, dwelt the happy Hyperboreans. To the south were the Ethiopians, who also dwelt in bliss. To the west lay the Elysian Plain, to which favored mortals were transported without suffering the pain of death.

ROMAN MYTHOLOGY. Roman mythology, like the Roman people, was a composite affair, its various traditions having been for the most part introduced by the various tribes who successively entered Italy and had a part in forming the nation. The Roman pantheon includes many gods which seem to have been borrowed from the Greeks. In other instances, the Greek name and attributes were identified with some Roman god, and the Greek stories concerning the god adopted as well. In still other cases the apparent similarity between Greek and Roman gods is a result of both conceptions having been derived from a common source. In the various forms of worship the Romans retained a much more noticeable independence of Greek influence. The Roman idea of worship was in the nature of a bargain. The Roman worshiped the gods who favored him, and while they favored him. If their favor appeared to be withdrawn he ceased to worship. A list of the names of the most important divinities of Greece, with the name of the Roman counterparts, follows. The fact that the Roman names are the more familiar to us is an evidence of the fact that the English language has been influenced more largely by Latin than by Greek. The twelve Olympian gods are mentioned first.

Greek.	Roman.
Zeus	Jupiter
Hera	Juno
Aphrodite	Venus
Athene	Minerva
Ares	Mars
Hermes	Mercury
Demeter	Ceres
Poseidon	Neptune
Artemis	Diana
Hestia	Vesta
Apollo	Apollo
Hephaestus	Vulcan
Helios	Sol
Cronos	Saturn
Rhea	Ops
Dionysus or Bacchus	Bacchus
Persephone	Proserpine
Eros	Cupid
Chloris	Flora
Gaea	Tellus
Hades	Pluto or Tartarus
Selene	Luna

SCANDINAVIAN MYTHOLOGY. According to the mythology of the Scandinavians found chiefly in the Icelandic Eddas, there was before the creation only a "world of mist" in a great deep. In this deep flowed a fountain from which issued twelve rivers. These rivers, flowing far from their sources, finally froze into ice and filled the deep. From the world of light which was southward from the world of mist, came a warm wind and melted the ice. As the vapor arose, it formed into clouds from which sprang Ymir, the Frost Giant, and his cow, Audhumbla. The cow licked frost and salt from the ice. One day she licked so vigorously that she uncovered something like hair; the next day a head appeared and the third day the full form of a god who became the father of Odin, Vili, and Ve. These three brothers slew Ymir and made the universe from his body, using his blood for the seas, his skull for the sky and his eyebrows for Midgard, the earth, the abode of man. Odin created the sun, moon, and stars, and with his brothers made a being from an ash tree, whom they called Aska, man, and from an alder made Embla, woman. Odin gave these beings life and soul. Vili gave them reason and motion. Ve gave them senses and speech.

A mighty ash tree, Ygdrasill, grew up out of Ymir's body and supported the universe. Its three immense roots extended, one into Asgard the dwelling of the gods, one into Jötunheim, the abode of the giants, enemies of the gods, and one into Niffleheim, the region of darkness and cold. Odin or Woden is the most important of the gods, Frigg is his wife, and they dwell in Asgard. His dwelling is Gladsheim, home of gladness. Valhalla is his banquet hall. Thor, the thunderer, is the son of Odin, and strongest of the gods. Bragi is the god of poetry. Iduna, his wife, has a box of apples, of which the gods partake in case they feel age approaching. With the taste of Iduna's apples, they become young again. Heimdall is the watchman of the gods who prevents the giants from crossing the rainbow bridge Bifrost. He can see in the dark, can hear grass grow, requires less sleep than a bird, and possesses a horn which can be heard over the whole world. Loki is half-man and half-giant. He pushes into the society of the gods and appears to be friendly, but in reality is mischievous and evil-minded. The Fenris wolf, the Midgard serpent, and Hela (Death) are his children.

It was believed by the northern nations that a time would come when all visible creation, including gods, giants, and men, would be destroyed. Then would follow Ragnarök, the twilight of the gods. After various forerunners of the evil day, Heimdall would sound his horn summoning gods and heroes to the last great battle in which all must die, and the heavens and the earth would be destroyed. After Ragnarök, Alfadur (Almighty) would construct a new earth where gods and men might dwell together in happiness.

American Indian Mythology. The traditions and myths of the various tribes of Indians differ in some respects, but certain beliefs are common. They believe in the existence of one Great Spirit, the Master of Life. The most common name for this supreme being is Gitche Manitou. The institution of totemism is common among them. They believe generally in the immortality of the soul, various materialistic ideas as to the future life finding expression in different mortuary customs. Imbecile explanations of occurrences are satisfactory. An important myth, which has been of influence in many tribes, is the story of a hero of miraculous birth who comes to teach and aid his people, who leaves the earth when his work is accomplished, but who is expected to return at some future time. Longfellow uses this myth as the foundation of his poem, *Hiawatha,* into which he has woven many of the most fanciful legends and pleasing myths of the Indians. Among them are the story of Nokomis, who fell from the moon; of the lazy Shawondasse, who wooed the prairie dandelion; of Oweenee, and her husband who is released from enchantment by her faithful love. In this poem we see, too, how animals, birds, trees, and inanimate objects are endowed with personality. The hunter listens to the speech of squirrel and rabbit; the fisherman asks the sturgeon to take his bait; Hiawatha speaks to the cedar, the larch, and the fir, when he goes to the forest for material for his canoe. He whispers to the canoe itself when he shoves it into the water. We read, too, of the smoking of the peace pipe, of blessing the cornfields, of the wedding feasts, the game of plum stones, the death dance, the beggar's dance, of the fear of ghosts, of famine, of fever, and of faith in the Great Spirit and the Land of the Hereafter. See Hiawatha.

Mary Blanchard Murphy.

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Nabob, an East Indian term from the Hindu, signifying a deputy governor. In the history of the Mogul Empire, the viceroys or governors of provinces are known as nabobs. These deputies had opportunity to oppress and to plunder. "As rich as a nabob" became a proverbial saying. By degrees the term was transferred to persons, particularly Anglo-Indian officials or traders, who acquired wealth in India and surrounded themselves with oriental luxury. "He went to India a poor clerk and came back a nabob" might be heard in London.

Naboth, a worthy Israelite, the owner of a plot of ground and a vineyard on the eastern slope of Mount Gilboa, Palestine. This fair possession attracted the covetous eye (Kings xxi) of Ahab, whose royal palace stood hard by. King Ahab offered his subject another and a better field in exchange, but the sturdy commoner refused to part with "the inheritance of my fathers." Jezebel fastened a lying accusation of blasphemy upon Naboth, as a result of which he and his two sons were stoned to death. But no sooner had Ahab gone down to take possession of the coveted vineyard than Elijah confronted him with: "In the place where dogs licked the blood of Naboth shall dogs lick thy blood, even thine," and "the dogs shall eat Jezebel by the wall of Jezreel." The story of Naboth is used to illustrate the tendency of the powerful to overreach the weak.

Nadir. See ZENITH.

Nagasaki, nä-ga-sä′kĭ, an important seaport of Japan. It is situated on a magnificent bay on the southwestern side of the most southerly of the principal Japan islands. It was the first Japanese port open to European vessels. The privilege of trading was enjoyed by the Dutch alone for over two centuries. In 1858, as the result of a visit by Commodore Perry of the United States Navy, Nagasaki and four other ports were thrown open to the Americans and English as well. The harbor has been improved by the construction of excellent docks. The chief exports are coal, rice, shell fish, paper, and cotton. Imports of sugar, kerosene, machinery, locomotives, and tobacco, intended for consumption in the southern part of the empire, are landed here. The population in 1920 was given as 176,554. It is a center of Japanese shipbuilding.

Naiads. See NEREIDS.

Nail, a headed peg of metal to be driven through pieces of wood or other material to hold them together. A very large nail is a spike; a very small nail is a brad or tack. Iron is the material used ordinarily, although brass and copper, rarely gold and silver, are employed for decorative purposes. Nails are used principally in putting up wooden buildings, fences, and the like, but they play an important part also in the making of boxes, trunks, picture frames, and many other articles. They are used in upholstering, horseshoeing, coopering, and many other trades. A hammer and a box of nails are considered a necessity in every household. Almost all nails for common use are made from wire, and in their manufacture over a half million tons of wire are used in the United States every year. The number of tons of wire used in the manufacture of nails in the United States in the year 1920 was 32,274.

Among the ancients nails were precious articles. They were made, of course, by hand. In the early trade with the African tribes and the South Sea Islanders a few nails ranked in purchasing power with a hand mirror or string of beads.

Hand-made nails, or wrought nails, are forged, one by one, from nail-rods turned out by the rolling mills. The best horseshoe nails are made still by hand. Machinery for making cut nails was invented by Ezekiel Reed of Bridgewater, Massachusetts, as early as 1786. A patent was granted an English inventor about the same time. In making cut nails the iron is first rolled into ribbons or strips of suitable width and thickness. As the strip is fed through a machine, the nails are sheared crosswise from the end of the slip. As each nail falls off it is caught by the neck in a slit. A

blow from a heavy hammer-like die forms the head. The finished nail then slides along a trough into a keg set ready to receive it. In order to secure a taper, the shear is set obliquely. The head or wide end of the first nail is taken from one edge of the strip; the head of the next nail from the other edge, etc. A machine cuts from 10 to 1,000 nails a minute, according to size.

Wire nails are a French invention. They were popular in England before they were introduced into the United States. They were made at first by cutting wire into lengths. One end was pointed on an anvil. The wire was then held in a vise, while a head was formed by a few taps of a hammer. Their manufacture was begun in the United States in 1850. They attracted general attention at the Centennial Exposition in 1876, and have since driven cut nails almost out of the market. Steel wire is fed into the American nail machine from a huge spool. A pair of V-shaped pliers cuts the wire into nail lengths, leaving one end square and pinching the other to a point. A trip hammer forms the head. The nails are polished by tumbling about in a drum and striking on each other. They run through spouts into 100-pound kegs. A wire nail machine makes about 500 three-penny nails a minute. Spikes are turned out at the rate of one a second. In the large factories many machines run side by side.

There are over 300 styles and sizes of nails in the trade. The word penny used in connection with the size of nails means pound. A six-penny nail weighs six pounds to the thousand nails, etc. When a nail has been driven through, and the point bent over and driven down so that the nail cannot be pulled out, then it is said to be clenched or clinched,—whence the popular expression "to hammer home an argument, and clinch it." "To hit the nail on the head," is another popular saying for which we are indebted to the driver of nails.

Name, personal, the word or words by which a person is known. The Medes, Persians, Hebrews, and Greeks, and the early Romans and the Anglo-Saxons, were content usually with one name each, but English-speaking people in general have a given name and a family or surname. Our Christian or given names are derived from many sources. Moses is Egyptian, meaning drawn-from-the-water; Darius is Persian, meaning preserver. Of Hebrew names Aaron means inspired; Abel, breath; Adam, man; Asa, healer; Caleb, a dog; Lot, a veil; Huldah, a weasel; Jemima, a dove; Mary, bitter; Rachel, ewe; and Ruth, beauty. Greek names have a similar range of meaning. Andrew signifies strong; George, a husbandman; Giles, a kid; Lycurgus, a wolf driver; Stephen, a crown; Cyrus, the sun; Helen, bright; Margaret, a pearl; and Dorcas, a gazelle. Among names of Latin derivation are Calvin, meaning bold; Martin, warlike; Miles, a soldier; Cicero, a vetch-grower; Oliver, an olive tree; Patrick, a nobleman; Paul, little; Peter, a rock; Rufus, red: Nora, honorable; and Stella, a star.

Genuine English names are equally expressive. Edwin is a gainer and Edward a guardian of property; Edith, a rich gift; Eric, brave; Harold, a champion; Matilda, a heroine; Donald and Duncan are Celtic, meaning a proud chief and a brown chief respectively. Other Celtic names are Arthur, proud; Brian, strong; Kenneth, a leader. Napoleon is French, signifying the lion of the forest vale, and Algernon, likewise French, means having whiskers.

Family names grew up no doubt by way of distinguishing the many Johns and Marys from each other. It is likely that John Baker and John Webster were originally John the Baker, and John the Webster, respectively. Then, too, John at the Wood and John by the Spring became simply John Wood and John Spring.

The Scandinavians had a way of distinguishing people of the same given name by adding the name of the father. Peter Johnson and Peter Ericson were sons of John and Eric. Not infrequently the family takes the name of the farmstead. During the Scandinavian occupancy of Great Britain many such family names became permanent. The Jonsons, Thompsons, Petersons, Jacksons, Wilsons, Williamsons, and Nelsons, of Scotland, England, and the United States were originally quite as Scandinavian as the Olsons, Swensons, Carlsons, and Hansons of later migration.

The Gaels or Highlanders of Scotland

and the Erse or Irish formed family names by prefixing Mc, Mac, or O to the given name of an ancestor. McDonald signifies son of Donald; and O'Brien, son of Brien. The old rhyme,

> By Mac and O
> You'll always know
> True Irishmen they say,
> For if they lack
> Both O and Mac
> No Irishmen are they,

holds quite as true of Scotchmen. Whereever Macadams, McAllisters, Macaulays, Macbeths, McCalls, McCarthys, McClellans, M'Clintocks, McClaskeys, McClures, McCooks, McCormicks, McCoshes, MacDonalds, MacDougalls, Mackintoshes, McKinleys, McLeans, MacLeods, MacMasters, McIntyres, McPhersons, or McVeys are found, they are of Celtic ancestry,—Scotch or Irish. The O'Briens, O'Connors, O'Connells, O'Donnels, O'Donovans, O'Neils, O'Riels, and O'Reilleys, need not hesitate to call themselves Irish. The corresponding Welsh prefix is Ap. From its use we have the family names of Price, Powell, Bevan, Bowen, Prichard, Probert. They are contractions of Ap-Rice, Ap-Howell, Ap-Evan, Ap-Owen, Ap-Richard, and Ap-Robert. Still other Welsh family names are Barry from Ap-Harry, and Pugh from Ap-Hugh. The Norman-French prefix Fitz, seen in Fitzpatrick, Fitzsimmons, Fitzgerald, and Fitzjames, has the force of Mac, O, and Ap.

English surnames are derived from a number of sources. Nearly all the popular colors as White, Brown, Black, Green, and Grey are represented. Personal peculiarities seem to have fastened the name to the head of many a family. Some evidently had Spindleshanks, others Sheepshanks or Crookshanks. Littlejohn and Micklejohn are names of this class. Bunyan, if we may believe the dictionary, is Norman for Good John. Like people of the present time, our ancestors appear to have been Little, Long, Short, and Stout. They were Gay, Jolly, Meek, Moody, Wise, Sage, Merry, and Stern. Some appear to have been Rich, and others Poor. Lackland is a common name.

Occupations appear to have conferred many family names. Regardless of present occupations, it is not difficult to guess the ancestral calling of a family known as Farmer, Shepherd, Taylor, Baker, Weaver, Carpenter, Brewer, Smith, Wright, Painter, Cook, Collier, Goldsmith, Mason, Miner, or Woodman. Webster is an old word for weaver. Fletcher is an arrow-maker. Places of residence supply many family names. Such are Brooks, Dale, Wood, Forest, Town, Turnstile, Mill, Hill, Field, Meadow, Burns, Grave, Shaw. Many names are derived from animals and plants, as Fish, Bull, Roebuck. Such names as King, Prince, Pope, Bishop, Abbot, Prior, Steward or Stewart are indicative of service in a household of rank.

The German *von,* the Dutch *van,* and the French *de* mean of. They are prefixed commonly to the names of family estates or places of residence. So far as they go, they are indicative of descent from landholders. Von Humboldt, Von Bismarck are written usually without the von; but the Dutch van persists in Vandyke, Van Sant, Vanderbilt, Van Buren, Vandieman, and Vancouver. The French *de* or *d'* appears in De Candolle, D'Aubigné, De Staël, De Tocqueville, De Grosse, De Lafayette, De Kalb, De Witt, and Delaware. Plain Foe, the son of a butcher, changed his name to De Foe to give it a Norman sound.

In Spain a married woman retains her own name. A son may take the family name of either parent. In Great Britain a person may change his given name and his family name at will. In the United States a name may be changed by legislative enactment, or, in many states, on application to the courts.

Namur, an important manufacturing and commercial city of Belgium. It is situated at the junction of the Sambre and the Meuse, thirty-five miles southeast of Brussels. Namur is an ancient city, dating from the time of Caesar. It has been the scene of many a deadly battle. The English and Dutch under William III of England took it by siege from Louis XIV in 1695. A citadel dating from 1784 still stands on a rocky promontory. The old walls have been leveled to make way for boulevards. There are few ancient buildings. The city has a modern aspect. The inhabitants are chiefly Walloon, that is to say, French.

The streets, shops, public buildings, commercial houses, and churches imitate those of Paris. Coal, timber, and iron in the immediate vicinity from the basis of extensive manufactures. It is in the center of a productive agricultural region. The rivers afford facilities for navigation. Numerous railways connect with France, Germany, and Holland. The population in 1920 was 32,274.

Nanaimo, British Columbia, a city and a port of entry, is on the east coast of Vancouver Island, 40 miles west of Vancouver and 73 miles north of Victoria. It has steamer connection with Vancouver, and is served by the Esquimalt & Nanaimo Railroad, a Canadian Pacific subsidiary. This city is in the center of an extensive coal producing region, and contains manufactories of explosives, sashes and doors, bricks, brewery, foundry and machine shop products and other articles. Fruit and vegetables are raised in large quantities in the adjacent country.

Nanaimo has a good public school system, which includes a high school; it also has a Roman Catholic convent and a business college. There are three theaters and several good hotels. The population was 9,025 in 1921.

Nancy, an important city of northeastern France. It is situated on a level plain on the left bank of the Meurthe, a few miles from its junction with the Moselle. As the capital of the ancient province ot Lorraine it is a place of some historical importance. It is now the seat of Meurthe et Moselle. The city is handsomely laid out in rectangular fashion. There are fine promenades and public squares adorned with statues of prominent men. The city is noted for fine churches. St. Epvre ranks high among the Gothic churches of France. Its lofty tower and a portal are considered unsurpassed. Other buildings of note are the city hall and the ducal palace. There is a public library of nearly 100,000 volumes. The University of Nancv was founded in 1572. It was established on its present site two centuries later. There are important manufactures of woolen and cotton cloth. The lace and embroidery are celebrated. There are also extensive tanneries, breweries, and manufactures of iron. The old walls of the city, now torn down to make room for boulevards, withstood many a siege. Population, 1921, 113,226.

Nankin, or **Nanking,** a populous city of China. It is situated on the southern bank of the Yang-tse-Kiang, 194 miles west from Shanghai, and nearly equally distant from Canton and Pekin. The name signifies southern capital. It was at one time the capital of the empire and was stroyed by rebels, such is the account. The present population is estimated at 376,291. The culture of the ancient court lingers. It is said that the purest Chinese is to be heard in Nankin.

As long as Nankin was the residence of the emperors, it was a literary center. The city is still famous for its manufactures of artificial flowers, nankeen cloth, satin, paper, and porcelain. It contains the chief arsenal of the Chinese Empire. Cannon and firearms are manufactured under the direction of European foremen. The city is about twenty miles in circumference. It was formerly surrounded by a wall forty feet high, portions of which still remain.

The famous Porcelain Tower, one of the historical features of the city, is an eight-sided pagoda about 260 feet in height. The summit bore a gilt ball fixed at the top of an iron rod. Pearls hang on chains from the rod.

Nansen, nän′sen, **Fridtjof** (1861-), a noted Norwegian explorer. He was born near Christiania, October 10, 1861. He studied at the university of that city, taking a special interest in natural science. In 1882 he accompanied a sailing vessel into the Arctic Ocean in order to study the seals and other forms of northern life. On his return he was made director of the Bergen museum of natural history. In 1888 he traveled across Greenland somewhat north of the latitude of 64°. An account of this trip was published subsequently with the title of *Across Greenland.* Later he became curator of a museum in Christiania and professor of zoölogy in the university. In 1893 he completed the construction of a vessel, the *Fram,* designed for Arctic exploration. It was framed with unusual strength to withstand the crushing

pressure of ice. In 1879 the Jeannette, a ship fitted out by James Gordon Bennett of the New York *Herald*, entered the Arctic by way of Bering Strait. It was abandoned in the ice in 1881. Three years later articles from the ship were found on the shore of Greenland. Nansen argued that a strong ship entering the ice pack from the coast of Siberia would, in time, drift across an open polar sea and appear on the northern coast of Europe. With this theory in mind, Nansen and his crew reached a point in latitude 83° 59′. Here he left the Fram and crew. He and his lieutenant with sledges, dogs, and canoes traveled northward to latitude 86° 14′ the highest latitude at that time reached by an explorer. His ship succeeded in penetrating as far as 85° 57′. On his return in 1896 he published an account of his voyage under the title of *Farthest North.* It is an exceedingly readable book.

As professor of oceanography at the University of Christiania he has done important work on the variation of oceanic currents. He became interested in relief work during the World War, especially among prisoners of war. In 1921 he was appointed as one of the commissioners in charge of the relief of the starving Russian people. For this work Nansen was awarded the Nobel Peace Prize. Among his recent books are *Northern Mists* and *Through Siberia.* See ARCTIC REGIONS.

Nantes, nănts, a city of France. It is situated on the northern bank of the Loire, about forty miles from the Atlantic. A ship canal enables vessels of large size to reach the wharves. It is a well built city. Five miles of quays line the banks of the river. In 445 it marked the utmost westward limit of the Huns, and successfully withstood a siege of sixty days. It was taken by the Normans during their invasion of France. During the attempts of the English to conquer France Nantes was taken and retaken a number of times, suffering severely from fire. The famous Edict of Nantes was issued by Henry IV April 30, 1598. Until its repeal in 1685 it secured the Protestant Huguenots freedom of worship. See HUGUENOTS.

Nanticoke, Pa., an industrial borough in Luzerne County, is on the Susquehanna River, seven miles southwest of Wilkes-Barre. It is served by the Delaware, Lackawanna & Western and Central of New Jersey railroads and by several interurban electric lines. The mining of anthracite coal is the principal industry, but there are manufactories of silk, hosiery, cigars and canned goods.

Nanticoke has a state hospital, high school, several parks, city hall and other fine public buildings. The first settlement was made here in 1850 and the town was incorporated in 1870. In 1920 the population was 22,614.

Napanee, Ontario, a port of entry and the county town of the united counties of Addington and Lennox, is situated on the Napanee River, which is navigable to the Bay of Quinte, distant seven miles, which in turn connects with Lake Ontario. Toronto is 135 miles to the west. Abundant hydro-electric power is available, and is used in the manufacture of carriages, motor boats, flour and grist, furniture, lumber, bricks, machine shop and foundry products and canned fruits and vegetables. The town is the commercial center of a large mixed farming region.

Besides the public schools there is a collegiate institute and a library. Transportation facilities are good; those by rail are afforded by the Canadian Northern and Grand Trunk roads. In 1921 the population of Napanee was 3,038.

Naphtha, năf′tha or năp′tha, a colorless liquid obtained in the distillation of petroleum. It evaporates readily. It is used as a substitute for turpentine in the manufacture of paints and varnishes. Naphtha takes up grease readily and is used in cleaning gloves, the collars of soiled clothing, etc. Crude petroleum yields from six to twelve per cent of its own weight of naphtha. See PETROLEUM.

Napier, nā′pe-er, **John** (1550-1617), a Scottish mathematician, the inventor of logarithms. He interested himself in devising a burning glass with which he hoped to set fire to the works of the enemy. He also devised a piece of artillery that swung on a pivot, so as to destroy everything within a

certain arc. A contemporary humorously states that it was tried on a Scottish plain, with the slaughter of many cattle and sheep.

His great work, however, was the devising of a table of logarithms or indices designed to reduce the labor of multiplying and dividing large numbers. It was published in 1614. The computation of a table of logarithms as devised by Napier is a work of enormous labor, but, once completed, it saves the student time.

Henry Briggs, an eminent English mathematician, journeyed to Edinburgh to see so eminent a man. When introduced they sat silently, so the account runs, for a quarter of an hour, each looking at the other with admiration. "My lord," began Mr. Briggs, "I have undertaken this long journey purposely to see your person and to know by what engine of wit or ingenuity you came first to think of that most excellent help unto astronomers, viz., the logarithms; but, my lord, being by you found out, I wonder nobody else found it out before, when now known it is so easy." The friendship thus begun was continued throughout life. Briggs assisted Napier by important suggestions and by extending the table.

Naples, in population, the chief city of Italy. It is situated on a beautiful bay of the same name, 160 miles southeast of Rome. The bay is nearly semi-circular in shape. It is regarded as one of the most beautiful bodies of water in Europe. "See Naples and die," is an Italian way of saying the world has no prettier view. The city is situated on the northern border, occupying a shore line of about five miles. Mount Vesuvius rises in the immediate vicinity. The streets of Naples are paved with volcanic rock. In order to avoid danger from earthquakes the buildings are of unusual solidity and are flat topped. The greater part of the city is squalid. The business quarter and residence section are handsomely built. Cholera epidemics have aroused the authorities of the city to the necessity of waterworks and adequate sewerage. The public buildings are imitations of those at Rome. A national university occupies buildings formerly belonging to the nobility. There is a library of 275,000 volumes and a museum containing not only a large number of paintings and pieces of sculpture, but a number of relics from Herculaneum and Pompeii as well. The Farnese Bull and the Farnese Hercules are here. It is the most important collection in the world of Etruscan, Roman, and Italian antiquities. The university dates from from 1224. There are over 9,000 students in attendance.

Naples is a characteristic Italian city. A large population is packed within a small compass. The streets are thronged with itinerant venders, carrying their wares in baskets, in carts, or on mules. There is a perfect babel of noises. Bright costumes of various colors add picturesqueness to the scene. It is the second seaport of Italy. There are exports of olive oil, wine, wool, macaroni, raw silk, ribbons, and silk goods, tallow, dyestuffs, licorice, figs, coral, hemp, linseed, and chemicals. The city is noted for its manufactures of glass, chinaware, perfumery, artificial flowers, soap, musical instruments, silks, millinery, and macaroni. The fisheries are of importance. Tourists set out from Naples to visit Vesuvius and the Isle of Capri. Thousands of American and European tourists visit Naples annually. The climate in the winter season is delightful. The sea and the sky are unsurpassed. There are excellent hotels. There are beautiful drives. The city itself is a place of never ending variety. The shops and streets are of interest, both to scholars and to sightseers. Of a morning the milkman drives his flock around the narrow streets and milks his goats at his customer's door.

Naples may be considered the center of coral manufacture. Crude coral from the shores of Sicily, Sardinia, Africa, and even from Japan is made into beads and jewelry. The raw material costs the jeweler from forty cents to $20 a pound, according to quality. A bewildering array of coral ornaments are pressed upon the attention of the traveler. Beautiful necklaces are offered at from $15 to $200 each. The population in 1923 was 698,000.

See VESUVIUS; POMPEII; CAPRI; EARTHQUAKE.

Napoleon Bonaparte, Napoleon I (1769-1821), emperor of France. He was the second of five sons. The father, Charles

NAPOLEON'S FAREWELL TO JOSEPHINE

"My Destiny and France Demand It"

From the Painting by L. J. Pott

Bonaparte, was a Corsican lawyer of an old Italian family prominent in camp and court for six centuries. A Bonaparte was banished from Florence as early as 1120. Charles, the father, seeing resistance useless, became reconciled to the French seizure of Corsica and stood well at the French court. He resided at Paris for several years as the head of a delegation of his countrymen. He had but small means, it would appear, but he had sufficient influence to place his children in the best schools of France. Napoleon, the second son, entered a military school at Brienne, where he was noted for ability in mathematics. He had a fondness for the lives of great men and for military tactics, with little liking for anything else. He was not popular. He spoke French with difficulty, Italian being his native language.

As a natural consequence of a military education, he received an appointment in 1785 as a second lieutenant in the French army. When the French Revolution broke out he shrewdly took the side of the people against the monarchy. He soon rose by reason of his military ability and showed himself a masterly hand both in conducting a siege and in handling the mobs of Paris.

In the wars that the young French republic found on its hands Napoleon was made commander-in-chief of the army. He conducted a brilliant campaign against the Austrians in Italy in 1796-7; carried the French arms into Egypt and Syria in 1798-9; and in 1799, under the forms of a new constitution, he made himself first consul, virtually supreme ruler of France. In 1802 he became consul for life, and in 1804 he assumed the title of emperor, and settled into the rôle of military despot.

We cannot go into the history of the Napoleonic wars. They are still the wonder of military history. In the earlier part of these wars Austria was the most determined opponent. Napoleon led an army over the Great St. Bernard in the spring of 1800, dragging his cannon in the trunks of trees hollowed out to contain them. The battles of Marengo and Hohenlinden prostrated the house of Austria, and made Napoleon dictator of continental Europe. This assumption of power was by no means agreeable to Europe. In 1803 Russia, Austria, England, and Sweden formed a coalition against Napoleon. Napoleon defeated Austria and Russia at Austerlitz, December 2, 1805, and seemed to entrench himself all the more firmly.

In 1808, Napoleon entered on the Peninsular campaign, an effort to subjugate the Spanish people. Here he met his first rebuff. Though temporarily successful in placing his brother on the Spanish throne, the determined opposition of the Spaniards, animated by patriotism, exhausted his forces, and ultimately contributed to his downfall. These things were not at once apparent, however. In 1810 he was at the height of his power. He had formed a marriage alliance with Austria; Russia and Prussia were nominally allies; the rest of western Europe, except Portugal, was subject to or dependent upon him.

Of course such a career could not go unchecked. If boys roll a snowball large enough it breaks finally of its own weight. France could not become Europe. In 1812 the beginning of the end came. Napoleon invaded Russia with 400,000 troops and seemingly drove the Russians before him to Moscow where he proposed to winter. Suddenly fires broke out in every direction, the city was in flames, and Napoleon with his thinly clad army was left without shelter or supplies. Winter fell, a retreat was ordered. What with bitter frost, snowstorms, treacherous ice and rivers, burning bridges, starvation, fatigue, and the harassing assaults of legions of active, warmly clad, well fed, and well mounted Cossacks, swarming like hornets, only 20,000 men of that vast army reached the frontiers of Poland. Now that disaster had come, the nations rose against him. Napoleon took the field the next summer at the head of 600,000 men but was defeated at the battle of Leipsic October 16-19, 1813. The troops of Austria, Prussia, and Russia, joined by those of the Rhine principalities, marched on Paris and occupied that city. Meanwhile the English under Wellington had assisted the Spanish in driving the French over the Pyrenees.

Napoleon was stripped of his territory and power, yet was permitted to retire to the little island of Elba, which was assigned him as an empire, and he was still

allowed to retain the title of emperor. A year later, while the powers were in conference at Vienna endeavoring to rearrange the map of Europe, their deliberations were disturbed by the ill news that the emperor of Elba had landed on the coast of France and that his old soldiers had flocked to his standard. All in vain, however. Napoleon had tried too much. Had he been content to remain within the natural borders of France he might have been eminently successful, but it was too late to play the role of Alexander the Great and obtain world-wide power. The battle of Waterloo fought June 18, 1815, went against him. Napoleon was sent to St. Helena, England's prisoner of war, where he lived for six years quarreling with the commandant and writing his memoirs. May 8, 1821, he was buried at St. Helena, but in 1840 his remains were removed to Paris, where they lie beneath the dome of the Hotel des Invalides. His sarcophagus is a single polished stone of red Finnish granite, thirteen feet long, six and one-half wide, and fourteen and one-half high. The circular crypt in which the sarcophagus stands is of polished granite adorned with sculpture commemorative of Napoleon's work. On the pavement are recorded the names of his battles.

There is no reason to say that Napoleon had any love for the common people or that he tried to make life easier for them; but in carrying out his selfish schemes to obtain power for himself we may say that he did much for the popular cause. Himself an unscrupulous aristocrat and despot, he destroyed many a stronghold of aristocracy and pulled down many aristocratic families. He reformed the laws of France, abolishing many an injustice. *The Code of Napoleon* is still used in France, Rhenish Prussia, Bavaria, Baden, Holland, Belgium, and Italy, and is the basis of legal procedure in our own state of Louisiana. He threw magnificent bridges over the Seine, straightened out the streets of Paris, especially in the poor quarters, laying out boulevards radiating from a common center from which cannon could be used to suppress uprisings. He built roads, second only to those of the Romans, encouraged manufactures, granted religious liberty, restored Sunday formerly abolished by the Revolutionary authorities, and declared a general amnesty for past political offenses. Forty thousand royalists banished by the Revolution returned to France.

In a way, Americans have a special interest in the Bonaparte family. In 1803 Jerome, the youngest brother of Napoleon, visited Baltimore in command of a French frigate. He was received with enthusiasm by the exclusive society of the city. On the eve before Christmas he was married by Bishop John Carroll to Miss Elizabeth Patterson, the beautiful young daughter of a wealthy merchant. When Jerome and his wife sailed for France she was forbidden to land and sought refuge in London. Napoleon desired Jerome to marry a European princess and sit on a European throne. Jerome tried, we may believe, to change the emperor's mind, but, failing in this, abandoned his wife to her father's care. Descendants of the marriage have borne themselves creditably in the world and are still living.

All this is a piece of the same treatment that Napoleon accorded his own faithful wife. In 1796 he married the beautiful Josephine, who was the companion of his years of struggle. She stood by his side when he was crowned. They had no children. He was ambitious to be the head of a new royal family. The French officials granted him a divorce. In 1810 he married an Austrian archduchess, a member of the famous Hapsburg family. They had one son, but he died young. Writers have not failed to note that Napoleon's star seemed to set from the day when he discarded Josephine. A book in which Napoleon kept notes when a schoolboy has been preserved. Strangely enough, the last entry closed with the words: "St. Helena, a small island."

The ship is over the bar, then; free she bounds shoreward, amid shouting and vivats! Citoyen Buonaparte is "named general of the interior, by acclamation;" quelled sections have to disarm in such humor as they may; sacred right of insurrection is gone forever! The Sieyes constitution can disembark itself, and begin marching. The miraculous convention ship has got to land; and is there, shall we figuratively say, changed, as epic ships are wont, into a kind of Sea Nymph, never to sail more; to roam the waste azure, a miracle in history.

FRIEDLAND

From the Painting by E. Meissonier in Metropolitan Museum of Art

"It is false," says Napoleon, "that we fired first with blank charge; it had been a waste of life to do that." Most false: the firing was with sharp and sharpest shot: to all men it was plain that here was no sport; the rabbets and plinths of Saint-Roch church show splintered by it to this hour. Singular: in old Broglie's time, six years ago, this whiff of grapeshot was promised; but it could not be given then; could not have profited then. Now, however, the time is come for it, and the man; and, behold, you have it; and the thing we specifically call *French Revolution* is blown into space by it, and become a thing that was!—Carlyle, *French Revolution.*

Napoleon III (1808-1873), emperor of France. He was a nephew of the first Napoleon, being the son of Louis Bonaparte, king of Holland. Napoleon's only son, who died young, was called Napoleon II by the Bonaparte family. The subject of the present sketch is usually called Louis Napoleon. After the downfall of his uncle, Louis was recognized by the family and the old party as the Bonaparte heir. He lived abroad necessarily. He landed twice on French territory to incite a revolt against the Bourbon family, once in 1836 at Strasburg, and again in 1840 at Boulogne; but was treated leniently. When the French republic of 1848 was proclaimed he was elected to the French legislature. He commenced an active canvass for the presidency, and such was the glamour of the Napoleonic name that in December of the same year he was elected president of the republic by an overwhelming majority. Louis Napoleon was wholly inferior to Napoleon I; he was an unscrupulous schemer but lacked the ability of his distinguished uncle. He was vain, self-important, and fond of making a show. He was precisely the kind of man whom unscrupulous politicians put forward. They led Napoleon to consider himself great, that they might gather the plunder of place under him. Although he took the oath to support the constitution and pledged himself repeatedly to stand by a popular form of government, there never has been any question but that he plotted from the first to overthrow the republic and reinstate a despotic form of government.

The radical party, the Reds of Paris, played into the hands of the monarchists. They rose in arms and were not only put down by force, but the Assembly passed a reactionary suffrage act depriving the greater part of the workingmen of the right to vote. Here the hypocritical Louis Napoleon made a vast pretense of being on the side of the artisans, and led them to regard him, demagogue that he was, as their leader. The Assembly was made unpopular, the body of middle class citizens feared another revolution and looked to the "brilliant, able young statesman," now president, as the one man whom the populace would accept. Napoleon's term was nearing an end; the constitution forbade reelection; the Assembly refused to change the constitution; so this great and good man, rather than deprive France of his services at so critical a juncture, arrested some eighty generals, journalists, and leaders of the Assembly after nightfall, closed all the printing offices, placarded the streets with warning handbills to the effect that the Assembly had been dissolved, and that Napoleon had placed himself at the head of a new government and would appeal to the popular vote—no one disfranchised—for a ratification of his course. Tools were placed in command of the army, the Assembly tried to get together, but the members were dispersed or put under arrest; the radicals rose and barred the streets, but the soldiers marching in the name of the law, and carrying the tricolor of France, charged the barricades and violated the laws of honorable warfare by butchering whole batches of defenseless prisoners whose views of popular government were at fault and needed a little amendment. Martial law was declared in districts considered dangerous to the plans of the conspirators. Thousands of the most determined men were hurried off to the penal colonies without trial.

It can hardly be deemed strange that a few days later, under the combined influence of the peasants, the gentry, the officeholders, and military officers, with here and there a military escort, the French "people" voted by 7,500,000 out of 8,000,000 votes not to let so good a chance of securing Louis Napoleon's services go by. In November of the next year, a second vote obtained in a similar manner confirmed this shameless adventurer emperor of the French, Napoleon III. As a matter of fact, France was stolen bodily in the broad day-

light of the nineteenth century, and the world acquiesced.

Historians consider the early years of the empire, 1852-60, a period of oppressive despotism. Spies were sent over the land. Servants were bribed systematically to betray their masters. "Suspects" guilty of talking at their own firesides or at an inn over a bottle of wine were whisked away to penal colonies, quite in Russian fashion. Newspapers were subsidized brazenly, or were suppressed. Official candidates were presented for election to local offices. Opposing candidates were forbidden the use of halls; their mail was not safe from being tampered with; their placards were torn down or covered with official announcements. There was neither free speech nor a free press; but through it all Napoleon seems to have flattered himself that he was a democratic sort of a leader, and during the latter part of his reign a far less degree of tyranny was exercised.

In the meantime material prosperity was to be seen on every hand. Manufactures were encouraged. Paris was rebuilt largely. Other cities followed the example of the capital, and made extensive improvements, prosperity being manifest everywhere. France, naturally a rich nation, established schools, opened libraries, and undertook projects of internal improvement. The empire of Napoleon III was preëminently a period of a full dinner pail for artisans and workmen. A showy foreign policy was pursued. In 1854 Napoleon joined England in the Crimean War. In 1859 he aided Victor Emmanuel in the unification of Italy. During our Civil War he aimed to place a European prince, Maximilian, on the throne of Mexico. He concurred in the opening of the Suez Canal, invited the nations to a "World's Exposition," and did much to entertain the French and to beautify Paris.

Napoleon III was a weak, pretentious man who depended largely on the fame of his uncle. Unfortunately for his prestige, he brought on war with Prussia in 1870 for which that country had been a score of years making preparation. The Franco-Prussian war showed the rotten condition of French politics. Dishonest contractors and inefficient commanders rendered the French unable to cope with their adversaries. The German forces proved so superior in the battle of Sedan that Napoleon threw himself upon the generosity of King William rather than face the people of Paris. The present French republic was declared. Napoleon was held prisoner until the close of the war, when he was permitted to join his wife and son at Chiselhurst, England, where he resided until his death. His only son entered the British army and was killed in a petty skirmish in Zululand, Africa.

See FRANCO-PRUSSIAN WAR.

Napping, in the manufacture of textiles, the process of raising a fibrous nap on the surface of cloth. Teasling and gigging are other names for napping. In most cases, napping is confined to woolen goods. Outing cloths and canton flannel are among the cotton goods that are napped. The purposes of napping are many and varied. It is done to render the fabric warmer, or softer, or more pleasing to the touch, or for ornamentation, or to conceal defects caused by imperfect threads. Nap is raised sometimes in order to shear every loose fiber and thus reveal the pattern of the weave more plainly. The operation of napping is performed by means of vegetable teasles, or by wooden rollers covered with fine steel teeth. The teasle is a thistle-like plant, the flower heads or burs of which are covered with scales which end in sharp hooks. Formerly these burs or teasles were set in a small frame, which a workman used over the surface of the cloth, much as one uses a currycomb. At present the teasles are arranged in a frame carried by a machine. The thousands of strong elastic hooks on the teasles scratch the surface of the cloth, loosening and raising the short fibers. The teasle is cultivated in many places for the sake of these burs. The napping machine performing the work by means of teasles is called a "gig," while that using rollers covered with metal teeth is called a wire napper. After napping, the cloth is sheared to even the nap. The shearing or cropping machine works on the same principle as a lawn mower. The tip ends of the fibers may be removed or the nap may be cut close to the thread.

Narcissus, när-sĭs′sŭs, in Greek mythology, a beautiful youth, son of the river god, Cephissus (se-fis′us). He was handsome, selfish, and vain. Having caught sight of his own fair face and drooping ringlets in a spring, he mistook the reflection for a water nymph. Hoping she might come out to meet him, he hung lovingly over the brink until there was nothing left of him but the waxy, beautiful, pool-loving flower that bears his name. According to another account, excessive vanity was sent upon him as a punishment for cruelty to the nymph Echo, whom he allowed to pine away to a mere voice in unrequited love. See DAFFODIL; ECHO.

Narcotic, a substance which has a stupefying or benumbing influence. Narcotics quiet the nerves. In medicine they are used to produce sleep or to relieve pain. The chief narcotic is opium with its preparations, known as morphine, laudanum, and paregoric. Opium contracts the eye; belladonna dilates the eye. Other narcotics are hops, henbane, stramonium, camphor, coffee, Indian hemp or hashish, and bromide of potassium. Soothing syrups, painkillers, anodyne liniments, and all similar preparations depend on some narcotic, frequently opium, for their efficiency. Children are particularly susceptible and should be given exceedingly small doses, if any. Alcohol in all its forms—ale, beer, wine, hard cider, rum, and whiskey—is a narcotic. As in the case of opium, the first effect of a small quantity is a temporary excitement. The final effect, if the dose be large enough, is to produce the peculiar helpless, languid stupor called drunkenness. The well known narcotic influence of tobacco is due chiefly to an essential oil called nicotine; though pure nicotine is a rank and dangerous poison. The trouble with the use of all narcotics is that the system becomes used to artificial soothing and demands more and more of it until the victim of a narcotic habit is enslaved. See TOBACCO; HASHISH; OPIUM.

Narvaez, när-va-ĕth′, **Pamfilo de** (1470-1528), a Spanish soldier in America. He came to the New World in 1498, settling in Santo Domingo. He took part in the conquest of Cuba, and in 1520 was sent by Velasquez to supersede Cortez in Mexico, and to punish the latter for disobedience. The expedition was unsuccessful. Cortez' army defeated Narvaez, who lost an eye in the battle, and was deserted by the remnant of his army. Narvaez returned to Spain and in 1526 was appointed governor of Florida. He left Cuba in 1528 to explore and conquer the territory allotted him. After great hardships and the loss of half his men on the inland march, he returned to the shore only to find his ships gone. Boats were built and the little party sailed westward but was shipwrecked, only four men escaping with their lives. One of these, Cabeza de Vaca, after eight years of wandering, arrived at a Spanish settlement on the western coast of Mexico; his tales of the "seven cities of Cibola" was the incentive for the expedition of Coronado.

Narwhal, a small whale found in arctic waters with a body possibly fifteen feet in length. It is noted for a peculiar tusk. A straight tooth projects directly forward from the upper jaw to a distance of six or ten feet, giving the animal the name of unicorn whale. The tusk is valuable for ivory, and the blubber yields a superior quality of oil. See WHALE.

Nasby, Petroleum V. See LOCKE, DAVID ROSS.

Nashua, N. H., the second city in the state and the county seat of Hillsboro County, is on the Nashua River, 40 miles northwest of Boston. It is on several branches of the Boston & Maine railroad, and is also served by interurban electric lines.

Nashua is an important industrial center. Power is developed from the river and turns the wheels of factories producing shoes, cotton goods, overalls, paper, cards, hardware, clippers and shears, edge tools, saddlery, furniture, refrigerators and other articles.

The city has a United States fish hatchery, a Federal building, Nashua Sanitarium, Hunt Home, Memorial and St. Joseph's hospitals, a Y. M. C. A., Greeley Park and the Church of Saint Francis Xavier and many others. Nashua was settled in 1655 and incorporated by Massachusetts in 1673. In 1746 it was incorporated by New Hampshire. In 1920 the population was 28,379.

Nashville, the capital and second city of Tennessee and the county seat of Davidson County, is situated on the Cumberland River, 233 miles northeast of Memphis and 186 miles south by west of Louisville, Ky. The city, built chiefly on the left bank of the Cumberland and covering about 21 square miles, is regularly laid out. It occupies a plot of gently sloping land that rises, at the highest, 650 feet above sea level. Nashville is served by interurban electric lines, by the Louisville & Nashville, Tennessee Central and Nashville, Chattanooga & St. Louis railroads, and by river steamers.

Parks, Buildings and Institutions. The parks of Nashville are numerous and all are very attractive. Chief among them are Shelby, Watkins and Glendale parks and the Cumberland Driving Park. The state fair grounds are very attractive.

The capitol is dominant among Nashville's public buildings; it stands in a commanding position on a hill in the center of the city. On the grounds are an equestrian statue of Andrew Jackson and the tomb of James K. Polk. The Parthenon, state prison, city hall, post office, court house, Federal building and Galloway Memorial and St. Thomas' hospitals are also noteworthy.

Nashville is one of the most important educational centers in the South. A list of its institutions includes Vanderbilt University, Peabody College for Teachers, Meharry Medical College (colored), Fisk University (colored), Roger Williams University, Knapp School of Farm Life, Buford College for Women, Bescobel College for Women, St. Cecelia Academy for Women, Walden University, Ward-Belmont College for Women, and the medical and dental departments of the University of Tennessee. It also has a Carnegie library, the State Library, Howard Library and Watkins Institute, where are to be found the collections of the State Historical Society.

In or near Nashville are the Tennessee Boys' Reformatory, state insane asylum, Tennessee School for the Blind and the Confederate Soldiers' Home.

Industry and Commerce. Flour milling and the milling of hardwood timber are two important Nashville industries. The city is the second manufacturing center of the state, with factories producing clothing, boots and shoes, cigars, snuff, pottery, stoves, fertilizer, sashe and doors, automobiles and other articles. Since Nashville is in the center of a rich agricultural and lumbering region it carries on an extensive trade in flour, lumber, grain and fruit, and also trades in shoes, clothing, tobacco products, cotton, drugs and groceries.

History. Founded in 1780 by a pioneer band under the leadership of James Robertson, this city was first named Nashborough, in honor of Governor Abner Nash of North Carolina. The early settlers were almost constantly at war with the Cherokee Indians, who were finally driven out. A city charter was granted in 1806. The city was the temporary seat of the state government at two different periods before being finally chosen as the capital in 1843. In 1862 Nashville was taken by a Federal army, and was later the scene of one of the hardest battles of the Civil War. In 1920 the population was 118,342.

Nast, Thomas, an American caricaturist. He was born in Landau, Bavaria, September 27, 1840, and came with his mother to this country in 1846. While employed as a doorkeeper in Bryant's Art Gallery on Broadway, New York, he fell to copying the paintings. He also secured instruction in drawing. He showed decided talent and was employed as a draughtsman for *Leslie's Weekly*. In 1862 he was employed by *Harper's Weekly* to draw cartoons for that paper, and became the most famous political caricaturist of the day. During the Civil War, President Lincoln called him "Our best recruiting sergeant," and General Grant pronounced him "The most prominent figure in civil life to come out of the War of the Rebellion." His next great service was the destruction of the notorious Tweed Ring in New York City. Theodore Roosevelt is credited with saying, "I learned my politics from your cartoons." Nast had a fertile mind. He originated such symbols as the tiger for Tammany Hall, the elephant for the Republican

party, and the donkey for the Democratic party. We may add that in the service of party, Nast lampooned good causes just as industriously as he did evil ones. A clear instance of this was the persecution of Horace Greeley, whom many believe he sent to an early grave. In 1902 he was appointed United States consul at Guayaquil (gwī′ä-kēl), Ecuador, where he died of yellow fever in December of the same year. See CARICATURE; PUNCH.

Nasturtium, nas-tur′shum, a favorite garden plant of the watercress family, bearing large, round, curiously-shaped leaves and flowers of brilliant red or yellow hues. They are natives of South America and Mexico, but much favored in the United States as a climbing or trailing vine. There is also a low-growing, dwarfed variety.

Natal, one of the four original colonies of the Union of South Africa (which see) is a British possession on the southeastern coast of Africa. It is bounded by Portugese East Africa and Swaziland, on the north; by the Indian Ocean, on the east and south; and by the Drakensberg Mountains, on the west. The total area of Natal is 35,284 square miles, and the population is approximately 1,200,000. In 1921 there were about 138,000 whites in the colony. Durban, the chief port and city, had 140,324 inhabitants in 1921; Pietermaritzberg, the capital, had 35,077.

Natal is adequately watered and the quantity and quality of its agricultural produce are high. Sugar cane is a very important crop, and is followed by tea, corn, fruits, vegetables, tobacco, wheat and oats. The climate is healthful and equable; two crops of corn are grown each year. The province is rich in timber, and is highly productive of various barks and plants used in tanning leather. The mineral wealth of Natal is great; the most valuable mineral, so far as value may be measured by current production, is coal, the annual production of which is about 2,000,000 tons. Gold, asbestos, copper, fire clay, graphite, lead, silver, nickel, iron, limestone, marble, oil shale, tin, mica, molybdenum, manganese and gypsum are also found.

Natal has a large white population, before which the larger wild animals—hippopotami, hyenas, leopards, panthers, etc.—are rapidly disappearing. Much of the province, however, has yet to be won from the jungle.

By the census of 1920 there were 828 factories in the province; these produce clothing, boots and shoes and other commodities that may be manufactured from the raw materials yielded by the soil and the mines. Since early in the present century the colony has had a flourishing whaling industry. The principal imports into Natal are cotton and woolen goods, machinery, iron and steel goods, etc., the exports are wool, tan bark, hides and raw sugar.

HISTORY. The territory included in the province was visited and named by Vasco de Gama on Christmas Day, 1497. It was settled by Boers from Cape Colony in 1839, but the province was annexed to Cape Colonly in 1844. It was placed under a separate government in 1845, and was erected into a separate colony in 1856. During the South African War the colony suffered severely. In 1910 it was incorporated into the Union of South Africa. Since 1910 the administrator of Natal is appointed by the Governor-General in Council.

Natchez, a city in Mississippi, on the Mississippi River. The residence portion of the city overlooks the river from a great bluff two hundred feet high. Natchez does a large amount of shipping, having steamer connections with all the other important river points. The outlying country is rich in cotton, in which Natchez has a thriving trade. The city's principal industries center in the manufacture and shipping of cotton products. Other manufactures are ice, lumber, foundry products, machinery, furniture, barrel staves, etc. Stanton College and Baptist College for colored students are located there. Natchez has a number of fine public buildings and handsome residences, and an old French fort dating back to 1716. Outside the city lies National Cemetery, containing 3,159 graves, all but 379 of which are those of unknown dead, most of whom were soldiers of the Civil War. Natchez was a Confederate strong-

hold until 1863, when Federal forces took possesion after a long siege by Commodore Porter. From 1798 to 1800 Natchez was the capital of Mississippi. The population in 1920 was 12,608.

National Academy of Design, The, an institution giving instruction in the graphic arts, was founded in New York City in 1826. From October until May each year students here receive instruction in life, still life and antique drawing and painting, coin and medal engraving, composition, etching, anatomy and allied subjects. The Academy holds an annual student exhibition, at which prizes are awarded for exceptional work. Since 1906 the Academy has been affiliated with the Society of American Artists, with the Metropolitan Museum of Art and with Columbia University.

An Academy of Arts was organized in New York City as early as 1802, but it died out for want of members and support. In 1826 a new society was formed; the name adopted was the New York Drawing Association, but this was supplanted by the present name of the institution in 1828.

National Academy of Sciences, an organization of distinguished scientists incorporated by Congress in 1863 to investigate and report on scientific subjects and answer questions submitted to it by any department of the United States government. The expenses are paid by government appropriation. In 1920 there were 180 members comprising investigators in every department of science and so distributed as to represent all parts of the United States. The membership is divided into six groups, each group having charge of a special line of work. Annual meetings are held in Washington and a volume of *Proceedings* is published each year.

National Civic Federation, an American organization of representatives of capital and labor having for its purpose the lessening of industrial strife. The organization was formed in New York City in 1900, following a series of conferences of eminent leaders interested in solving the great industrial and social problems before the country. There are eight departments, each in charge of a special work.

1. Industrial conciliation department, dealing with industrial controversy.
2. Industrial economics department.
3. Welfare department, interested in the working condition of employes.
4. Women's department, investigating the welfare of women wage earners.
5. Department of compensation for industrial accidents and their prevention.
6. Social Insurance department.
7. Department on regulation of combinations and trusts.
8. Department of regulation of interestate and municipal utilities.

National Congress of Mothers and Parent-Teacher Associations. In February 1897 an assembly of parents, educators, clergymen and statesmen convened in Washington, D. C., to discuss and formulate plans for the betterment of child life. At this meeting the National Congress of Mothers and Parent-Teachers Association was organized. The main purposes of the organization as set forth in the constitution are:

The objects of this Congress shall be to raise the standards of home life; to give young people opportunities to learn how to care for children, so that when they assume the duties of parenthood they may have some conception of the methods which will best develop the physical, intellectual and spiritual nature of the child; to bring into closer relations the home and the school, that parents and teachers may cooperate intelligently in the education of the child; to surround the childhood of the whole world with that wise, loving care in the impressionable years of life that will develop good citizens; to use systematic and earnest effort to this end through the formation of Parent-Teacher Associations in every public school and elsewhere, through the establishment of kindergartens, and through distribution of literature which will be of practical use to parents in the problems of home life; to secure more adequate laws for the care of blameless and dependent children, and to carry the mother love and thought into all that concerns childhood. The Congress believes that, with the aid of Divine Power these objects will be accomplished.

Mrs. Phoebe A. Hearst and Mrs. Theodore W. Birney were the leaders in forming this organization, and Mrs. Birney became its first president. The Congress placed special emphasis on home life because of its far reaching influences. The cooperation of parent and teacher was realized and the Congress assumed the task of organizing the Parent-Teacher Associations and also of directing the home edu-

cation work of all these associations. The work of the Congress increased rapidly until it assumed a national and then an international scope. Among the most important measures in child welfare which are to the credit of this organization are: juvenile courts, mothers' pension laws, child labor laws, the expansion of the work of the United States Bureau of Education, to include a home education division which was opened in 1913. Through this division the following lines of work are pursued: (1) Promotion of the organization of Parent-Teacher Associations throughout the country, (2) assisting mothers of young children and prospective mothers by personal correspondence, bulletins and other literature, (3) the promotion of good reading among boys and girls and men and women. National and international conferences are held and the organization has secured a strong hold upon the educational movements throughout the country. See PARENT-TEACHER ASSOCIATIONS.

National Corn Exposition, a national agricultural exhibit held in Omaha in 1909. This exposition differed from other national fairs in that it was a purely business enterprise undertaken to impress upon the world-at-large the scientific advance that was being made along agricultural lines, particularly including reclamation of waste lands, irrigation projects, and similar improvements. The fair was the direct result of four great movements: The "short course" in agriculture and dairying which is now common to the agricultural colleges of the western states; the local experiment stations established by Illinois, Minnesota, Nebraska, and other states; the "seed-corn special" trains started in Iowa in 1904, and adopted in other states; the "short courses" held in various smaller towns in the corn belt to which farmers came bringing with them corn for study and exhibition.

Twenty-eight states were represented in the exposition building and numerous premiums covering every aspect of agricultural products were offered. For the best ten-ear collection of corn, the first premium was $2,500, and the prize-winning corn was auctioned off at the close of the exhibition, a single ear bringing from one to fifty dollars. One building was given up principally to alfalfa, the finest exhibit coming from Mississippi. In Industrial Hall with 55,000 square feet of floor space, were displayed farm machinery, seed-testing boxes, incubators, electrical appliances for the farm, and much more.

Besides the exhibits from the various states a number of foreign countries were represented, including Mexico, England, Canada, Hawaii, and Argentina, besides a number of private exhibits from other countries. The exposition was attended by thousands of people, many of them progressive farmers, eager to learn about the relative value of grains, and the adaptability of certain kinds to certain purposes and soils.

National Debt. See DEBT NATIONAL.

National Education Association. This association was established in Philadelphia in 1857. It was then known as the National Teachers' Association, and its aim, as the preamble to the constitution states, was "to elevate the character and advance the interests of the profession of teaching and to promote the cause of popular education." In 1870 the organization assumed its present name and was strengthened by the addition to it of the American Normal Association and the National Superintendents' Association. At its meetings held annually with the exception of the years, 1861, 1862, 1867, 1878, 1893, and 1906, various problems of interest to the teachers and educators throughout the country have been discussed, and the *Proceedings,* published annually, is looked forward to with interest because of the valuable information which it contains. The membership grew slowly at first; but the enrollment of active members approximates 4,000, and the attendance of associate members averages 10,000.

National Guard, a term applied in various countries to the militia. In the United States the term has come to be reserved to the organized militia, each state having its own volunteer organizations under the control of the governor of that state. They can be called on by him to quell riots, sup-

press insurrection, and repel invasion, but cannot be forced to serve outside the state.

Originally the term came into use as applied to the volunteer forces in France at the time of the French Revolution. In the days immediately preceding the attack upon the Bastille, when all things were in uproar, mob rule was dominant, and rumors were prevalent that the regular French troops were coming to put down the National Assembly and force the city into submission, the provisional government of Paris organized a volunteer military force, the National Guards for the protection of the city. July 15, after the fall of the Bastille, Louis XVI legalized their organization, and the tricolor cockade was adopted as their symbol, the red and the blue being the colors of Paris, while the white was that of the Bourbons. Lafayette was made commander. Throughout the Revolution they played an important part. After Napoleon came into power, National Guard was abolished, but always in times of revolution it has sprung again into existence, notably in 1830, 1848, and 1870. After the crushing of the Commune it came to an end. See BASTILLE; LAFAYETTE.

THE UNITED STATES. The national guard of the United States rendered invaluable service on the battlefields of France during the Great War. At the close of the war, a reorganization became necessary. The guard was placed under the direction of the militia bureau in the War Department, and it now comprises sixteen divisions of infantry, and one division of cavalry. The full quota requires 800 men for each senator and representative in Congress. The time of enlistment is six years —three years in active service, and three years in the reserve. Active service men meet at least 48 times a year for drill.

In time of peace, captains and officers of higher grades receive $500 a year; first lieutenants, $240; second lieutenants, $200, and privates one fourth the initial pay of regular army privates of the same grade. The national guard of a state cannot disband without the consent of the President, and the number cannot be reduced below that required by law. In time of war or threatened invasion, the President can call the national guard into the service of the United States.

National Parks, the large tracts of public lands owned and controlled by the government, set aside, improved and maintained in the same way as are the large forest reserves throughout the country. At present the national parks have an area of over 7,000,000 acres. The important ones are: The Yellowstone National Park, in Montana and Wyoming, over 2,000,000 acres; Yosemite National Park in California, approximately 1,000,000; the Hot Springs Reservation, Arkansas, 912 acres; Glacier National Park, Montana, 981,681 acres; Mount McKinley National Park, 1,408,000 acres; Grand Canyon National Park, Arizona, 806,400 acres; Mount Rainier National Park, Washington, 207,360; Crater Lake National Park, Oregon, 159,360; Sequoia National Park, California, 160,000 acres; Lassen Volcanic Park, California, 82,880; Mesa Verde, Colorado, 42,376 acres. See PARKS; YELLOWSTONE NATIONAL PARK; YOSEMITE, GLACIER NATIONAL PARK; HOT SPRINGS RESERVATION; SEQUOIA.

A complete list of the National parks (1923) is given in the following table:

		Acres
Abraham Lincoln Homestead*		
Antietam	Md	45
Chickamauga and Chattanooga	Ga. & Tenn.	6,195
Crater Lake	Ore.	159,360
General Grant	Cal.	2,560
Gettysburg	Pa.	877
Glacier	Mont.	981,681
Grand Canyon	Ariz.	806,400
Guilford Courthouse*	N. C.	125
Hawaii	Hawaii	74,935
Hot Springs Reservation	Ark.	912
Lafayette	Me.	5.000
Lassen Volcanic	Cal.	82,880
Mesa Verde	Colo.	42,376
Mount McKinley	Alaska	1,408,000
Mount Rainier	Wash.	207,360
Palm Canyons	Cal.	1,600
Platt	Okla.	848
Rock Creek	D. C.	1.600
Rocky Mountain	Colo.	230,000
Sequoia	Cal.	160,000
Shiloh	Tenn.	3,000
Sully's Hill	N. D.	960
Vicksburg	Miss.	1,233
Wind Cave	S. D.	10,522
Yellowstone	Wy., Mont. & Ida	2,142,720

Yosemite	Cal.	967,680
Zion	Utah	15,840
Zoological	D. C.	170

*In charge of secretary of war.

The following is a table of the national parks of Canada with their areas as given by the Canadian National Park Commission in 1923:

National Park		Area
Banff Nat'l Park	Alta.	2,751 sq. miles
Brereton Lake (Recreational Area)	Man.	Vacant lands around lake
Brodeur Island Park	Ont.	20 acres
Buffalo Park	Alta.	158.75 sq. miles
Elk Island Park	Alta.	51 sq. miles
Falcon Lake (Recreational Area)	Man.	Vacant lands around lake
Fort Anne Nat'l Park (Historic)	N. S.	30 acres
Fort Howe Nat'l Park (Historic)	N. B.	19 acres
Fort Pelly Park Reserve	Sask.	800 acres
Glacier Nat'l Park	B. C.	468 sq. miles
Jasper Nat'l Park	Alta.	4,400 sq. miles
Kootenay Nat'l Park	B. C.	587 sq. miles
Lesser Slave Lake (Recreational Area)	Man.	Vacant lands around lake
Menissawok Antelope Park	Sask.	17 sq. miles
Moose Mountain Buffalo Reserve	Sask.	1,440 acres
Mt. Revelstoke Nat'l Park	B. C.	100 sq. miles
Nemiskam Antelope Park	Alta.	8.5 sq. miles
Nora Lake (Recreational Area)	Man.	Vacant lands around lake
Point Pelee Nat'l Park	Ont.	4 sq. miles
St. Lawrence Island Parks	Ont.	140 acres
Tar Sand Reserve	Alta.	1,280 acres
Vidal's Point Park	Sask.	17.2 acres
Waterton Lakes Nat'l Parks	Alta.	220 sq. miles
Wawaskesy Antelope Parks	Alta.	54 sq. miles
West Hawk Lake (Recreational Area)	Man.	Vacant lands around lake
Yoho	B. C.	476 sq. miles

The United States and Canada are the only countries which have regarded parks as a national asset, and they are the only countries which have established them on a large scale.

Every national park on American soil has been chosen for a specific reason; consequently each park has one or more features which distinguishes it from the others. Collectively these parks are just national playgrounds set apart as specified in the act creating Yellowstone National Park, which was set apart for the use of all the people for all time.

Yet, there are constant attempts at encroachment upon them by special interests which value gain more than the beauty and grandeur of natural scenery, and whose promoters have no regard for the welfare of the people or the preservation of the wild animals which distinguish the fauna of North America.

Many states have followed the example set by the national government and created state parks, either for the forest preserves or to preserve inviolate spots of local historic interest or of special beauty.

National Road. See ROAD, subtitle *Highway*.

Natural Bridges, roadways of undisturbed, that is to say, living rock, extending across gorges or canyons. The term was given at an early day to a peculiar gorge at Cedar Creek, 125 miles west of Richmond, Virginia. The creek passes under a natural archway of limestone rock, all that is now left of a stratum that at one time must have covered the country. It may be likened to a cavern with the surrounding country gone. The arch is 200 feet high and about 60 wide. The sides are nearly perpendicular. The crown or thickness over the center of the arch is 40 feet. There are many natural bridges in America. One of these stone roadways crosses the canyon of the Verde River, 100 miles south of Jerome, Arizona. The span of this bridge is 200 feet long and about 180 feet wide. An old trapper is said to cultivate a garden patch on the bridge 200 feet above the torrent below. There is a natural bridge in Alabama, with a span of 120 feet. The Augusta Bridge in Utah is said to have a span of 320 feet, a height of 265 feet, and a roadway of 35 feet. The Augusta is the largest natural bridge known. Two other natural bridges, the Caroline and the Edwin, are located near the Augusta. Also in Utah is the beautiful Rainbow Bridge, 309 feet high, 248 feet between abutments, and from 30 to 42 feet wide on the top. It is in the southeastern corner of the state, 16 miles below the mouth of the San Juan River. This arch, composed of red sandstone, has been

made a national monument. See PETRIFIED FOREST.

As we draw near the big bridges, we feel an anxiety lest they fail to reach our expectations. Three of us have come a long and weary way in quest of them. Leaving the Rio Grande Western at Thompson's Springs, we came by stage to Moab, where Grand river was crossed, thence 125 miles by slow wagon with our instruments and supplies among mountains and wind-swept deserts, jolting over rocky wastes or dragging slowly through deep sands to the little town of Bluff, on the San Juan river. We still have sixty miles to go, but there are no more wagon roads, and we engage four men and twenty animals to take us the rest of the way, although our guide is the only man in Bluff who has ever seen the bridges. Then by devious and dangerous trails we come, over the break-neck Navajo Pass, splashing for miles up the muddy torrent of Comb Wash, riding the rims of sunken gorges, nooning at water-pockets made by recent rains, sleeping at night in great caves, until the high cedar ridge is reached and the bridges are close at hand.

From where we enter White Canyon, we make our way four miles up stream, floundering among quicksands and waterholes, breaking through copses of willow and scrub oak, crouching under boughs of great cottonwoods, cutting a new trail where recent floods have washed away the old one, and on making a sharp turn in the gorge, we behold one of the most magnificent and shapely structures ever achieved by Nature, the gigantic Augusta Bridge!

It is by far the greatest natural bridge in the world, being 265 feet from the stream to the causeway above. The latter is 35 feet in width and 83 feet thick, while the span is 320 feet. Hitherto it has been deemed inaccessible, but several of us reach the top by difficult climbing aided by rope ladders, and by use of our longest line make the above measurements, which we inscribe in durable oil paint, together with the name of the bridge, on one of the abutments. This we do over the signature of the Commercial Club of Salt Lake City, who sent out the expedition. The altitude at base is 6,050 feet above sea level, yet at one time, as geologists have proved, these ledges were beneath the ocean.

The Augusta bridge must henceforth rank with the greatest of natural wonders, and take its place with Niagara, the Yellowstone geysers, and the Grand Canyon in Arizona, as one of the masterpieces of American landscape. It is set in the midst of big things. The trees beneath are giants of their kind, the cliffs round about are massive and towering, but the sweeping lines of this colossal bridge dominate everything, making the horsemen look like pigmies and the great pines that cling to its abutments appear like shrubbery. It is of a light red hue, somewhat weather-stained in places, but glowing in color on the under side of the arch where it is protected and where the cleavages are fresh. A sense of enormous strength pervades it, a sense that it has endured for ages, and will endure for ages yet to come. A short steep canyon, stone paved, and without a vestige of soil, comes in from the south and joins the main arch beneath the bridge. High among the surrounding ledges, are many ruins of cliff-dwellings. —H. L. A. Culmer, in *Technical World.*

Natural Gas. See GAS, ILLUMINATING.

Naturalization, clothing an alien with the right of citizenship. Naturalization not only grants an alien the privileges of a native born subject, but it subjects him to all the burdens and duties of citizenship. It involves not only a solemn promise on the part of the alien to accept and perform the duties of citizenship, but it involves a renunciation of the allegiance which the alien owes to his native land. The alien not only surrenders the right to be protected by the flag under which he was born; he assumes the obligation to follow the flag of the country of which he becomes a citizen.

Citizenship was not conferred lightly by the ancients. The Romans held that a man might be deprived of life, but not of his citizenship. An outsider might be permitted to reside at Rome, to trade at Rome, but he could not become a Roman. When, later, Roman citizenship was granted, it was given first grudgingly to individuals, and then in a modified degree to towns. It was not until the days of Caracalla that citizenship was granted to all the free subjects of the Empire.

In Great Britain, not to mention the naturalization laws of modern continental Europe, instances of naturalization were rare, and, up to 1844, were granted only by special act of Parliament.

As might be expected from the flood of emigration that poured into this country, naturalization has been carried out on a greater scale in the United States than elsewhere.

The naturalization of aliens is considered a mark of civilization. The practice is now common in all civilized countries. It is an acknowledged principle of international law that each nation shall prescribe the conditions in accordance with which its citizenship shall be conferred. Great Britain, in particular, held tenaciously for a century or so to the notion that the consent of the native country is essential to complete naturalization. Prior to the War of 1812 the British insisted on the right

of taking from American ships naturalized American citizens, and requiring them to serve on British ships; this on the score that Great Britain had never given her consent to the naturalization of these alleged American citizens, and that they were therefore British subjects, liable to impressment for service at sea. This contention has been given up. During the Fenian uprising Great Britain had just cause of complaint. Irishmen came to this country, took out naturalization papers, returned to Ireland, and fomented disturbances, claiming all the time the protection of the American flag. When arrested and thrown into prison they appealed to the American ambassador for an enforcement of their rights as American citizens. This delicate question has been handled with diplomatic courtesy. The United States government has made it clear that naturalized citizens are entitled to the protection that may be accorded to native born Americans, but that they may not return to their native land and engage in illegal procedure and expect our government to rescue them from the consequences. This is in accordance with a sound principle of international law to the effect that citizens, while sojourning in a foreign country, shall be subject, in reason, to the laws of that country.

A historical view of the treatment accorded aliens may be found in an article under the head of ALIENS. Up to 1870 none but free white persons could acquire American citizenship. In that year the provisions of the statutes were extended to aliens of African nativity and persons of African descent. The privileges of naturalization are still denied to Asiatics, specifically to the Chinese, Japanese, and Malays. The naturalization laws of the United States in force in 1921 may be summarized as follows:

DECLARATION OF INTENTION.

The alien must declare upon oath before a circuit or district court of the United States or a district or supreme court of the Territories, or a court of record of the state of which he is a resident, that it is, *bona fide,* his intention to become a citizen of the United States, and to renounce forever all allegiance and fidelity to any foreign prince or State, and particularly to the one of which he may be at the time a citizen or subject.

PETITION ON APPLICATION FOR ADMISSION.

Within not less than two years nor more than seven years after such declaration of intention, he shall make and file a petition in writing, signed by himself (and duly verified by the affidavits of two credible witnesses who are citizens of the United States, and who shall state that they have personally known him to be a resident of the United States at least five years continuously, and of the State or district at least one year previously), in one of the courts above specified, that it is his intention to become a citizen and reside permanently in the United States, that he is not a disbeliever in organized government or a believer in polygamy, and that he absolutely and forever renounces all allegiance and fidelity to any foreign country of which he may at the time of filing his petition be a citizen or subject.

CONDITIONS FOR CITIZENSHIP.

He shall, before his final admission to citizenship, declare on oath in open court that he will support the Constitution of the United States, and that he absolutely and entirely renounces all foreign allegiance. If it shall appear to the satisfaction of the court that immediately preceding the date of his application he has resided continuously within the United States five years at least, and within the State or Territory where such court is held one year at least, and that during that time he has behaved as a man of good moral character, attached to the principles of the Constitution of the United States and well disposed to the good order and happiness of the same, he may be admitted to citizenship. If the applicant has borne any hereditary title or order of nobility he must make an express renunciation of the same. No person who believes in or is affiliated with any organization teaching opposition to organized government or who advocates or teaches the duty of unlawfully assaulting or killing any officer of any organized government because of his official character, shall be naturalized. No alien shall be naturalized who cannot speak the English language. An alien soldier of the United States Army of good character may be admitted to citizenship on one year's previous residence. Any alien in the United States navy or marine corps, who has served five consecutive years in the United States navy or one enlistment in the United States marine corps, and been honorably discharged, shall be admitted to citizenship upon his petition, without any previous declaration of his intention to become a citizen.

MINORS.

An alien minor may take out his first papers on attaining the age of eighteen years, but he can only become a citizen after having his first papers at least two years, and having resided within the United States five years, and after having attained the age of twenty-one years.

The children of persons who have been duly naturalized, being under the age of twenty-one years at the time of the naturalization of their parents, shall, if dwelling in the United States, be considered as citizens thereof.

CITIZENS' CHILDREN WHO ARE BORN ABROAD

The children of persons who now are or have been citizens of the United States are, though born out of the limits and jurisdiction of the United States, considered as citizens thereof.

An important change in the naturalization laws, affecting married women, was made by act of Congress approved September 22, 1922, which provided that after that date the citizenship status of a married woman shall no longer follow that of her husband, and that thereafter a married woman shall have the privilege of becoming naturalized on her own account. The two principal classes of married women referred to, with the means each class must take to acquire American citizenship, are as follows:

1. An alien woman marrying an American citizen after the passage of the above act, or any woman whose husband is naturalized after said act, may become naturalized by filing the usual petition and complying with all requirements of the naturalization laws, with the following exceptions: (a) No declaration of intention is required. (b) Only one year's continuous residence in the United States, Hawaii, Alaska, or Porto Rico immediately preceding the filing of her petition is required.

2. A woman who before the passage of the above act was an American citizen and lost her citizenship by marriage to an alien may become naturalized by filing the usual petition and complying with all the requirements of the naturalization laws, with the following exceptions: (a) No declaration of intention is required. (b) Only one year's continuous residence in the United States, Hawaii, Alaska, or Porto Rico immediately preceding the filing of her petition is required. (c) No certificate of arrival is required if during the continuance of the marital status she shall have resided in the United States.

An alien woman married to an alien at the time of the passage of the above act (Sept. 22, 1922), or who thereafter marries an alien, may become naturalized by complying with all requirements of the naturalization laws, including declaration, five years' continuous residence in the United States, one year continuous state residence, certificate of arrival if her entry dates from June 20, 1906, etc.

The act of 1922 further provides that no married woman whose husband is not eligible to citizenship shall be naturalized during the continuance of the marital status, and that she herself must be eligible to citizenship. Eligibility to citizenship is determined almost entirely by the question whether the persons concerned are "white persons" or "persons of African nativity or African descent," as provided by the Revised Statutes, and whether the husband is disbarred from citizenship because of withdrawal of declaration of intention under an act of July 9, 1918, for the purpose of securing immunity from military service during the war with the Central Powers of Europe.

The status of single alien women is not affected by the act of 1922, and women of this class may continue as in the past to file declarations and petitions for the purpose of becoming naturalized.

The United States has been known as a "melting pot" of the peoples of the earth. The population of North America, at first consisting of the ancient races such as the Aztecs, then consisted of the American Indian, and then, in the first days of alien settlement, of white people from Europe, English predominating. From the beginning immigration has been constantly increasing in numbers, and reached a million persons a year up to the beginning of the World War, Chinese and Japanese being rigidly excluded. At the present time other admissible aliens may come in at the rate of only 3 per cent. of their own nationality already in the United States, as shown by the 1910 census. In the industrial centers, population is very congested.

The 1920 census, showing a total population of 105,710,620, gave the number of native whites as 81,108,161; of native parentage, 58,421,957; of foreign parentage, 15,694,539; and of mixed parentage, native and foreign, 6,691,665. Those of foreign parentage and of recently immigrated foreign blood number more than 30,000,000.

Of the foreign-born population of the United States on January 1, 1920, those at

that time naturalized numbered 6,493,088; holding first papers only, 1,223,490; aliens, 5,398,605; citizenship not reported, 905,509.

Nature Study, a term applied to the means employed by educators to put the child in sympathetic touch with his natural environment. It is not a specific subject taught for a definite length of time or until a prescribed amount of work is accomplished; it is rather a continuous effort to develop in children the right attitude of mind toward life, and the things of air, earth, sea, and sky which are the common property of all. Lowell tells us that—

"No price is set on the lavish summer,
June may be had by the poorest comer."

The true teacher of "nature study" aims to lead the child to grasp this great truth, to keep eye, and ear, and mind, and heart open that he may take freely of the best that nature has to offer. From the child's point of view he studies, not from books but at first hand, the weather, the change of seasons, the snow crystals, birds, animals, butterflies, insects, plants, trees, the growth of grain, and of vegetables, their maturing processes, their harvesting, their values, the clouds, the stars, rocks, rivers, lakes, all the wonderful things he sees about him. He learns to feel a sense of ownership in these things, and not only does this feeling aid in his development but it gives him a source of pure pleasure and delight of which nothing in later years can rob him.

As early as the middle of the nineteenth century Horace Mann, following in the footsteps of Pestalozzi, urged the use of the inductive method and the substitution of real objects for symbols in early education. This was the beginning of "nature study" in our educational institutions. Its development was slow for some time, but since 1890 has been more rapid, and has been connected closely with the development of the laboratory method of studying the natural sciences.

Children attending school in the country have decided advantage over city children in the opportunity for "nature study," but with our city parks, and our street car systems which make excursions easy and pleasant, and with the possibility of school gardens, the capable and sympathetic teacher can find material wherever she is situated for this work.

The literature of the subject is rapidly increasing. It is of two classes: first, such books as are designed specially for the teacher, and set forth pedagogical ideas and principles, or give methods and suggestions for actual work; and second, those which are written for the popular reader. With these last the shelves of our libraries are loaded. They are oftentimes helpful and inspiring to both teacher and child. In making choice of such books for a child's use, the spirit in which the book is written is of more consequence than the actual facts contained. A story like that of Mowgli in Kipling's *Jungle Book* or like Long's *Following the Deer,* which makes the child feel a kinship with the wild things, are extremely valuable. In the same spirit—giving the "feel" of nature—are Hodges *Nature Study and Life,* Lange's *Handbook of Nature Study* and Comstock's *Handbook of Nature Study for Teachers and Parents.*

Nature Worship, the religion of those who see gods in the objects and the phenomena of nature, as in the sun, moon, and stars, in the fire, the wind, trees, mountains, fountains, streams, etc.

Herbert Spencer considers nature worship an outgrowth of ancestor worship. To his mind, "emergence of a people from a forest, confounded in tradition with emergence from the trees forming it, has led to the worship of trees as ancestors." Mountains are venerated for a similar reason. In his judgment, the stars are worshiped because they are believed to be the spirits of the departed. Certain North American Indians have, indeed, a myth that the Milky Way is the route of spirits on the way to the happy hunting grounds, and that the stars are camp fires. Mr. Spencer would have us think, also, that persons named for natural phenomena, as a child named the Dawn, from birth at an early hour, became afterward confused in the minds of descendants with that for which they were named, and that the break of day was worshiped on account of acts performed generations ago by a real person

whom they gave the name of Dawn, or light.

1. Nature worship, like ancestor worship, animal worship, the use of stone, and bronze, is world-wide in its occurrence.

2. A remarkable similarity in the choice of objects of worship, and a corresponding similarity in the legends held by the Eskimo, Hopi, Patagonian, Senegambian, Congo dweller, Bushman and Hottentot.

3. Nature worship is the basis of mythology.

Naugatuck, Conn., an industrial town and borough, is on the Naugatuck River, 27 miles northeast of Bridgeport and 5 miles south of Waterbury. It is served by the New York, New Haven & Hartford Railroad and by interurban electric lines. The industrial plants of Naugatuck produce such varied articles as knit goods, gas and electric fixtures, malleable iron, rubber goods, copper ware, chemicals, woolens, cut glass and mechanics' tools.

Naugatuck has a modern educational system, including a high school and Whittemore Memorial Library. The river is spanned by the Whittemore Memorial Bridge, and the city has a Federal building and a handsome post office. In 1920 the population was 15,051.

Nausicaa, nau-sic'a-ä, in the *Odyssey,* the daughter of Alcinöus, king of the Phaeacians. After leaving Calypso's Isle on the raft which the nymph had aided him to build, Ulysses was overtaken by storm. His raft went to pieces, but he swam to shore. It happened that he reached land in the country of the Phaeacians. Athene had sent a dream to Nausicaa—a dream reminding her that the family washing needed to be done. So the princess accompanied by her maidens, and with the soiled clothing heaped in a wagon, which carried also a hearty luncheon for the party, set off for the river. After the washing was completed and spread to dry the maidens ate their luncheon and then indulged in a game of ball. This, by Athene's guidance, took place near the spot where Ulysses was resting from his long swim. And—still by Athene's plan—Nausicaa threw the ball into the water. All the maidens screamed at this and Ulysses was awakened. Then, of course, Nausicaa gave him food and clothing and led him to her father, who aided him to reach Ithaca, his own island, and thus ended his wanderings.

Nautilus, The Chambered, a pearly-shelled mollusk. It is related, not closely, to the octopus, and yet more distantly to the snail. The shell of this nautilus is a flat coil like that of a land snail. The foot or muscular body, occupying the mouth of the shell, is divided into about forty tentacles. There are two eyes. The mouth is provided with a hardened beak like that of a snail. There is no ink sac. The chambered nautilus lives on the floors of the seas about New Guinea and the Philippines at a depth of from 325 to 2,300 feet. It swims by ejecting a jet of water, but it does not sail at the surface of the sea by hoisting a sail to catch the breeze. It feeds on deep sea mollusks, which it holds in its tentacles while it extracts the contents of the shell with its rasping tongue.

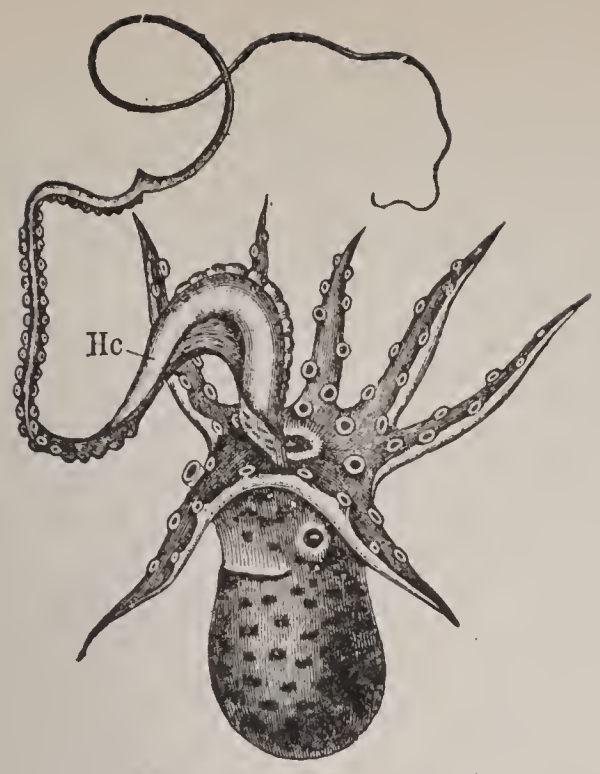
The chambered nautilus has a beautiful pearly shell of remarkable construction. The coiled shell is divided into chambers by cross partitions. A cut before the writer shows thirty chambers, each larger than its predecessor. The animal lives in the outer, the newest, largest chamber. The chambers are connected by a slender tube or siphuncle, coiling backward through the partitions to the original chamber. This siphuncle contains and is a part of the living animal, so that it is not exact, from a scientific point of view, to say that any part of the shell has been abandoned.

There are many fossil species, among which the ammonites may be named. A straight-shelled nautilus of bygone ages is called the Orthoceras from two Greek words meaning straight.

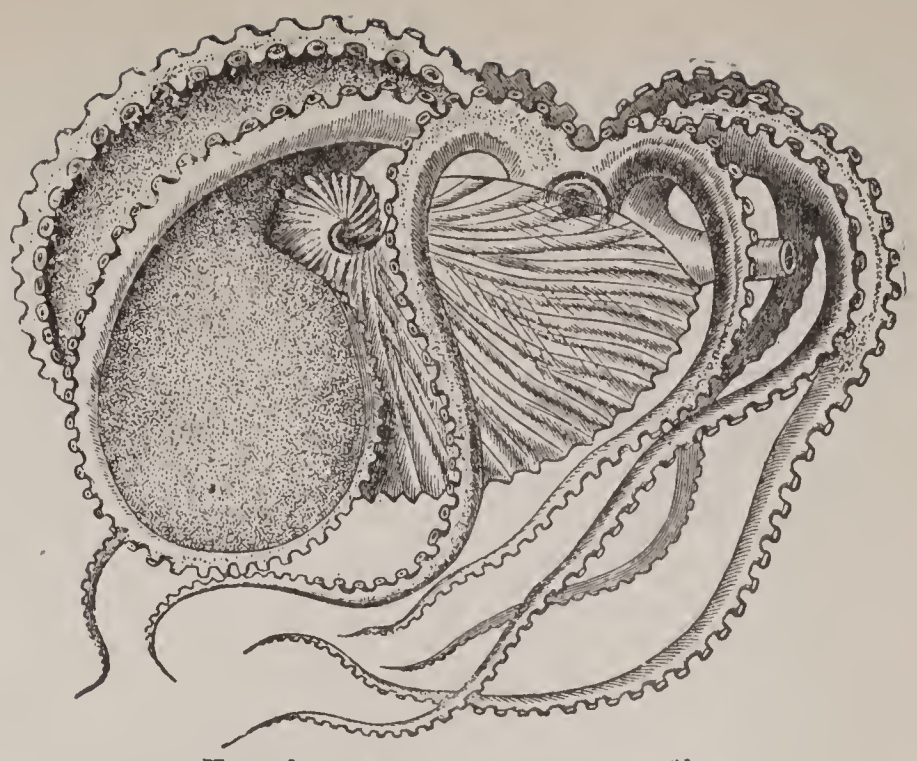
The poet Holmes has made beautiful use of the peculiar manner of growth in his poem *The Chambered Nautilus:*

Year after year behind silent toil
That spread his lustrous coil;
Still, as the spiral grew,
He left the past year's dwelling for the new,
Stole with soft step its shining archway through,
Built up its idle door,
Stretched in his last-found home, and knew the old no more.

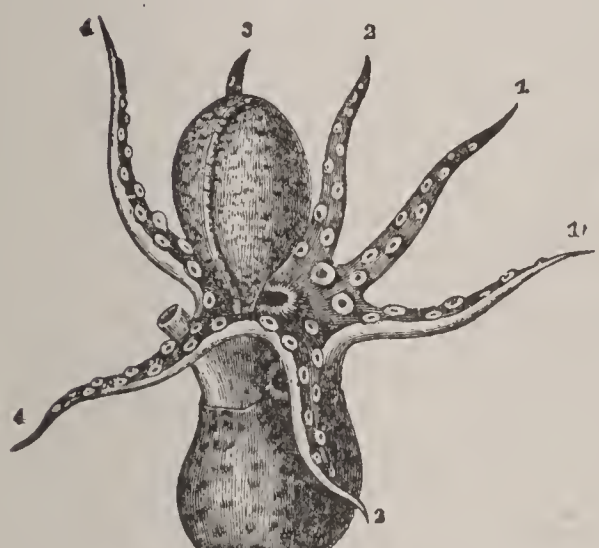
Build thee more stately mansions, O my soul,
As the swift seasons roll!



Male argonaut with long whip-like antenna.



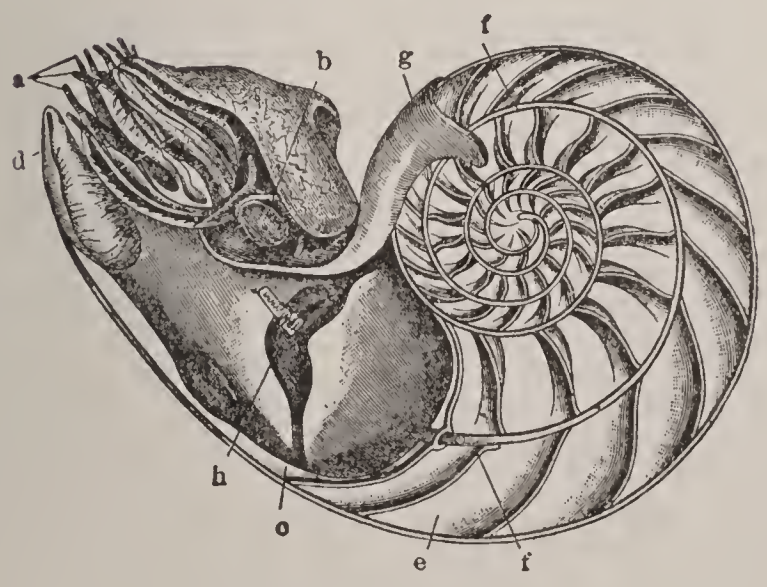
Female argonaut—paper nautilus.



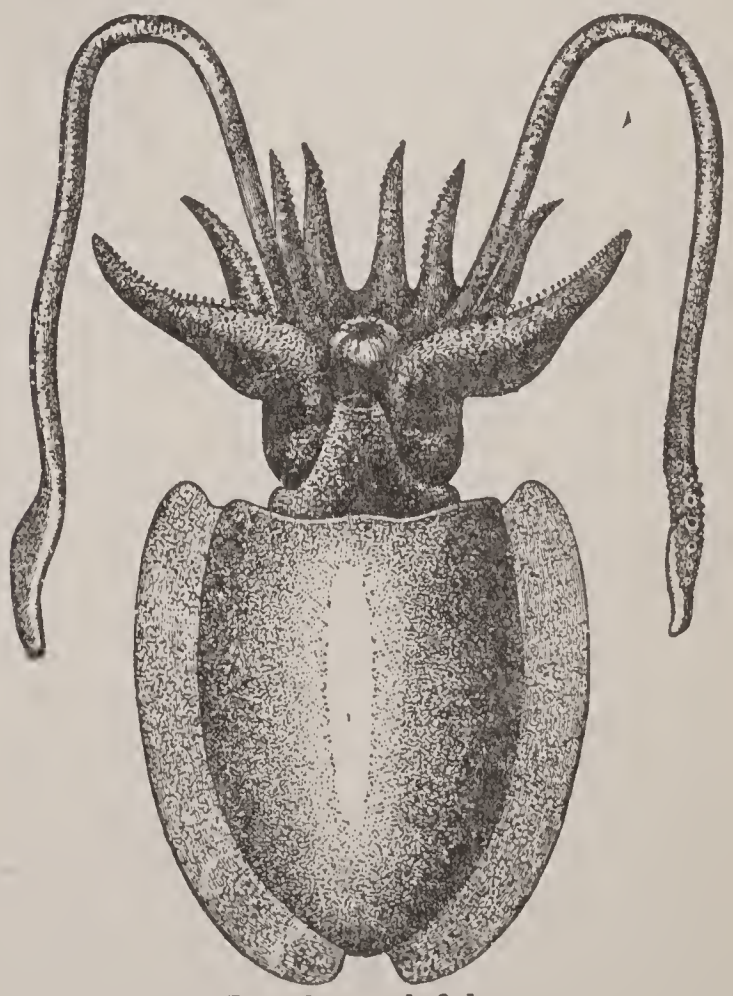
Male argonaut, with long antenna still included.

Male cuttlefish.

Spiral cuttlefish.



Chambered nautilus.



Female cuttlefish.

NAUTILUS AND CUTTLEFISH.

Leave thy low-vaulted past!
Let each new temple, nobler than the last,
Shut thee from heaven with a dome more vast,
Till thou at length art free,
Leaving thine outgrown shell by life's unresting sea!

The shells of the pearly nautilus (*Nautilus pompilius*) are common on the shores of warm seas, but the animals are very rare. Naturalists do not seem to know how to get them, though the natives of Fiji and New Hebrides, who appreciate their flesh, trap them successfully in lobster pots baited with crustacean or sea urchin. The animal creeps or swims gently along the bottom at no great depth, and its appearance on the surface, "floating like a tortoiseshell cat," is probably the result of storms. It is called "pearly" on account of the appearance of the innermost layer of the shell. This is exposed after the soft organic stratum and the median layer which bears bands of colour have been worn away, or dissolved in a dolphin's stomach, or artificially treated with acid.

The beautiful shell is a spiral in one plane, divided into a set of chambers, in the last of which the animal lives, while the others contain gas. The young creature inhabits a tiny shell curved like a horn; it grows too big for this, and proceeds to enlarge its dwelling, meanwhile drawing itself forward in the older part, and forming a door of lime behind it. This process is repeated again and again; as an addition is made in front, the animal draws itself forward a little, and shuts off a part of the chamber in which it has been living. The compartments seen on a divided shell are not exactly successive chambers, they are *fractions* of successive chambers abandoned and partitioned off as more space was gained in front. Moreover, all the compartments are in communication by a median tube of skin—the siphuncle—which is in part calcareous.

It has been suggested, that "each septum shutting off an air-containing chamber is formed during a period of quiescence, probably after the reproductive act, when the visceral mass of the nautilus may be slightly shrunk, and gas is secreted from the dorsal integument so as to fill up the space previously occupied by the animal."

Nautilus, The Paper, an eight-armed mollusk. It is allied to the cuttlefish and is related somewhat remotely to the chambered nautilus with which the poet Holmes confounded it. It is abundant in the Mediterranean. It is known to science as the *Argonauta argo* and is called commonly the argonaut. The male and the female differ widely. The body is an ovoid fibrous sack, the mouth of which terminates in eight tentacles armed with suckers. The body of the male is about an inch in length and is without a covering of shell. One of the tentacles of the male is developed into a long, whip-like organ. The body of the female is several inches long. Two of the tentacles of the female are broad and papery; they secrete a limy material by means of which the female nautilus builds a thin, papery shell or pouch about the lower part of her body in which to carry the young. These specialized tentacles not only provide the material, but serve as fingers to apply it in the making of the spiral, single-chambered shell. The sailors of the Mediterranean used to maintain that the paper nautilus hoisted these broad, thin, paper-making tentacles as sails and drifted before the wind. This fabled method of sailing and the confusion of common names led Holmes to write in his *Chambered Nautilus:*

This is the ship of pearl, which, poets feign,
Sails the unshadowed main,—
The venturous bark that flings
On the sweet summer wind its purpled wings
In gulfs enchanted, where the Siren sings,
And coral reefs lie bare,
Where the cold sea maids rise to sun their streaming hair.

As a matter of fact, the two tentacles in question clasp the shell in navigation. The six others trail in the shelter, while the body, shell and all, is propelled backward by a jet of water driven out through the siphon tube. The shell or egg case has no organic connection with the body.

There can be no confusion between the beautiful shell of the cuttlefish called the paper Nautilus (*Argonauta argo*), and that of our type. For it is only the female Argonaut which bears a shell, it is not chambered, and is a shelter for the eggs—a cradle, not a house. It is usually stated to be formed by two of the arms, but it seems doubtful whether it is not in reality due to the activity of the mantle.—J. Arthur-Thompson.

If we are very fortunate we shall see the paper nautilus, the most beautiful of all the mollusks. . . . . We may also see the animal leave the shell and move about, flushing a pale red, now a vivid blue. This is the animal that is supposed to raise its sails and float on the seas, "a thing of beauty and a joy forever." It is sad to break up these delightful fables, but the sail merely clings to the shell, and the shell is merely the egg-case or float for the strange creature.—Chas. F. Holder.

Learn of the little nautilus to sail,
Spread the thin oar, and catch the driving gale.
—Pope.

Navajo (nä′vä-hō) **Indians,** a tribe of natives closely related to the Apaches. They have dwelt for centuries in the arid coun-

try of northwestern Arizona. At various dates they have given trouble to the surrounding tribes and to the settlers, both Spanish and American. During the Civil War and soon afterward they were severely punished by Kit Carson, the Indian fighter. Efforts were made to remove them to the eastward, but they have been settled finally on a reservation of over 9,000,000 acres lying at the intersection of Arizona, New Mexico, and Utah. They now number about 16,000, but there is a large intermixture of Pueblo, Shoshonean, Yuman, and Spanish blood.

Crops are raised in the sandy soil along the streams. Horses, cattle, and flocks of sheep and goats are pastured on the uplands. An ancient art of weaving has been developed into an important village industry. The women weave the wool of the flocks on primitive hand looms, producing blankets, rugs, belts, garters, and saddle girths in a variety of bright colors and patterns. Red, black, white, yellow, and blue are favorite colors. Genuine navajo blankets are homespun, and are dyed with native plants and minerals—sumac, ochre, and pinon. They are woven so hard and tight as to be waterproof. Cotton warp, yarn, and aniline dyes are now sold to the weavers in quantity. Navajo blankets, in particular, are in demand for decorative purposes. Curio dealers ask from $1 to $100 for specimens of rugs and blankets. The industry brings in from $100,000 to $20,000 a year. Many of the men are skilled in hammering silver decorations.

The cultivated lands are chiefly garden patches devoted to the raising of corn, beans, melons, pumpkins, peaches and apricots, and a little wheat. The Navajo house is usually a sod but supported on sticks. When a death occurs, the family moves out, the props are pulled away, and the earth drops in and buries the dead. Several government and mission schools are maintained and efforts are made to encourage habits of industry and thrift.

See INDIAN; APACHE; BLANKET.

Naval Academy. See ANNAPOLIS.

Naval Observatory, a United States government institution situated at Washington, D. C., which constitutes a division of the bureau of equipment. Its functions are to determine the positions of the sun, moon, planets and stars, for the computation of time on United States ships; to correct daily local time; to test naval instruments; to disseminate astronomical information in the United States; and to issue the *Nautical Almanac*.

Its origin was a depot of charts and instruments which was established by the Navy Department under the direction and immediate charge of Lieut. L. M. Goldsborough, U. S. N., in 1830. In 1833 Lieut. Wilkes, U. S. N., built, at his own expense, an observatory which contained several instruments. In the summer of 1838, the superintendent of this observatory was instructed by the Secretary of the Navy to make a constant series of observations in astronomy, meteorology and magnetism, to add to the force of assistants, and to purchase all necessary additional instruments. A building was authorized by Congress in 1842 to house this depot, and Lieutenant Gilliss, after consulting many authorities, prepared the plans and specifications.

A great many important observations and discoveries have been made, such as the observations of Neptune in 1846, immediately after the discovery of that planet. The observatory is now fully equipped with modern astronomical instruments including one of the largest telescopes in use. The observatory also contains a library, which forms one of the most complete astronomical collections in the United States.

Naval Reserve, an auxiliary naval force of officers and men, under the direct control of a national government for use in time of need; in the United States, formerly, a body of state seamen, on the same legal footing as the state troops. The former class were later designated as naval militia, and were made auxiliary to the regular naval forces of the nation.

The present form of Naval Reserve was established by Act of Congress approved March 15, 1915, and subsequent amendments. It consists of officers and men who have had previous service in the navy and separated under honorable conditions, and other U. S. citizens whose professional experience has fitted them for the branch

of the reserve force in which they are enrolled. The Naval Reserve is organized under the Office of Naval Operations and the personnel administered by the Bureau of Navigation of the Navy Department, through the commandants of the several naval districts. When actively employed with the navy, members of the Naval Reserve are held and considered to be in all respects in the same status as the personnel of the navy on active duty. Enrollments are made for a period of four years. In times of peace, officers cannot be enrolled in, or promoted to, higher rank than that of lieutenant-commander.

On June 30, 1922, the personnel of the Naval Reserve force consisted of 5,340 officers and 10,966 men. This was a reduction by demobilization from 21,985 officers and 277,231 men in the reserve force in November, 1918, during the war period. The officers and men remaining in 1922, disproportionate in their respective numbers as they seem, constituted the nucleus of the present Naval Reserve force.

Naval Schools, institutions maintained by a government for the instruction of naval officers and seamen, or those preparing for naval service. All naval countries necessarily have such schools, or some equivalent means of instruction, especially for officers. In the United States, the Bureau of Navigation of the Navy Department is charged with the training and education of the line officers of the navy, and each staff bureau with the training of the staff officers.

Midshipmen, when appointed, are given four years' instruction in general and technical subjects at the Naval Academy, Annapolis. Upon graduation these midshipmen are commissioned as line officers, and are ordered to sea duty. After one year at sea, an officer may be sent to some special school. The principal schools at which special subjects are taught are as follows:

War College, Newport, R. I., one year course for officers of command or flag rank. This course includes theoretical instruction in the art of naval warfare, and war games played on game boards.

Naval Academy and various educational institutions, post-graduate work in ordnance, marine, gas, electrical, and radio engineering. Columbia University, Massachusetts Institute of Technology, George Washington University and Harvard are among these institutions.

Submarine work is taught at New London, Conn., where there is a three-months' course for officers, and torpedo work at the Naval Torpedo Station, Newport, R. I. Aviation is taught at Pensacola, Fla., and practical instruction in optical instruments and gyroscopic compasses, etc., is given at the Naval Gun Factory, the Ford instrument works, and other industrial plants.

For the education and training of enlisted men in the Navy, there are shore training stations at Newport, R. I.; Hampton Roads, Va.; Great Lakes, Ill., and San Francisco.

Navarre, na-vär′, an ancient kingdom of the Pyrenees. Its territory lay partly within northern Spain and partly within France. It arose about 900. Under Sanelo the Great, the Spanish kingdoms of Castile and Aragon were subject to Navarre. The Spanish portion of Navarre was conquered by Ferdinand, the husband of Isabella, in 1512. French Navarre remained independent until 1589, when Henry of Navarre ascended the French throne under the title of Henry IV. Thus Navarre bears somewhat the same relation to France that Scotland bears to England. It was the stronghold of the Huguenots.

Nave. See CATHEDRAL.

Navigation. See COMPASS; LOG; SHIP.

Navigation Acts, important acts passed by the British Parliament to protect home commerce and shipping. In 1631 during the Commonwealth, Parliament passed the law which is known as the First Navigation Act. It enacted that no merchandise should be carried to England or her colonies except by English ships built and manned by Englishmen. In the reign of Charles II, in 1663, the Second Navigation Act was passed. This restricted colonial shipping to English ports. Gradually the rights of the colonists were restricted more and more, and by 1761 so numerous were the acts in restriction of manufactures and commerce that the colonists, in order to exist, were forced to resort to smuggling as a

legitimate business. By means of smuggling, the American colonists subsisted, and trade continued irrespective of the twenty-nine restrictive acts; but this indulgence in secret trade was one of the factors which hastened the beginning of the American Revolution. See BOSTON TEA PARTY.

Navy, a term applied to all the ships belonging to a country, collectively; but specifically to the military marine, or the warships belonging to a government or a monarch, together with their officers and crews, equipment, and the department of government charged with their management and control; the entire naval establishment of a country. In Great Britain it is distinguished by the title Royal navy, and is governed by the Board of Admiralty. Control of the United States navy is vested in a cabinet officer called the Secretary of the navy, head of the Navy Department. For administrative purposes the navy may be regarded as divided into three parts: (1) the central administration, both military and civil; (2) the fleet, comprising the ships of every kind, including war vessels properly so called, or fighting ships, supply vessels, airplane carriers, transports, repair ships, hospital ships, and minor craft, with their personnel of officers and crews; and (3) the shore stations or navy yards (called dockyards in Great Britain) at which these vessels may be built and repaired, and receive their supplies of all kinds, and at which the military and civil personnel required for these purposes is stationed.

The navies of history may be classed as ancient, medieval and modern. Each era had its distinguishing characteristics in fighting ships. The ancient method of naval warfare consisted, in great part of boarding with hand to hand fighting as on shore, and of driving beaked vessels against each other. Therefore skill and celerity in maneuvering, so as to strike the enemy at the greatest disadvantage, were of the utmost importance, and the victory thus gained remained with the best sailor. The employment of the ram, which had become general in the days of the galley, necessarily fell into disuse in the era of sailing ships, but was revived by the advent of steam. Modern vessels however are no longer built with rams, as long range weapons make them futile.

The earliest powers having efficient navies appear to have been the Phoenicians, Carthaginians, Persians and Greeks. The Greeks had fleets as early as the beginning of the 7th century, B. C., the first sea-fight on record being that between the Corinthians and their colonists of Corcyra, 664 B. C. The earliest great battle in which naval tactics appear to have been distinctly, and successfully opposed to superior force, was that of Salamis (480 B. C.), where Themistocles, taking advantage of the narrow straits, forced the Persian fleet of Xerxes into such a formation that the lines of battle were nearly equal. The Pelopennesian War, where "Greek met Greek," tended greatly to develop the art of naval warfare, but the destruction of the sea power of the Athenians in 414 B. C. left Carthage mistress of the Mediterranean. The Roman power then gradually asserted itself, and after two centuries became omnipotent by the destruction of Carthage.

For several centuries following, the only sea-fights were occasioned by the civil wars of the Romans. Toward the close of the Roman Empire, the system of fighting with pointed prows had been discontinued in favor of the method which had always coexisted, namely, the running alongside of enemy ships, and boarding by armed men, with whom each vessel was overloaded. Onagers, balistae, and other crude devices for throwing stones, were ultimately carried in the ships and used as artillery; but they were little relied on, and it was usual, after a discharge of arrows and javelins, to come to close quarters. A sea-fight was therefore a hand-to-hand struggle on a floating base, in which the vanquished were almost certainly drowned or slain.

The northern invaders of the Roman Empire, and subsequently the Moors, seem to have introduced swift-sailing galleys, warring in small squadrons and singly, and ravaging all civilized coasts for plunder and slaves. This was the era of piracy, when every maritime nation, which had more to win than lose by freebooting, sent

out its cruisers. Foremost for daring and seamanship were the Norsemen, who penetrated in every direction, from the Bosporus to Newfoundland. Combination being the only security against these marauders, the medieval navies gradually sprang up, the most conspicuous being, in the Mediterranean, those of Venice, Genoa, Pisa and Aragon; on the Atlantic seaboard, the navies of England and France. In the Mediterranean, after a long struggle with the Genoese and subsequently with the Turks, Venice became the great naval power. The fleet of Aragon gradually developed into the Spanish navy, which by the time of Columbus had a rival in that of Portugal. Many struggles in the 16th and 17th centuries left the principal naval power in the hands of the English, French, Dutch, Spanish and Portuguese.

Modern navies of the world may be dated from the 16th century, when the British navy rose into prominence by the destruction of the Spanish Armada in 1588, a blow from which Spain never recovered. At that time there was little difference between the navies of England and France, and the Dutch navy was superior in strength to either of them. In the 17th century the Dutch lost their naval supremacy, France and England were rivals throughout the 18th century, and at the battle of Trafalgar, in 1805, a decisive British victory under Nelson established England in a position of first importance for the next hundred years.

In 1914, when the World War broke out, the principal navies of the world were those of Great Britain, Germany, the United States and Japan in the order named. The number and total tonnage of fighting ships of these powers was then as follows: Great Britain, 545 ships, 2,714,106 tons; Germany, 304 ships, 1,306,577 tons; France, 368 ships, 899,915 tons; United States, 187 ships, 894,889 tons; Japan, 145 ships, 699,916 tons. During the war all these powers added to their navies with feverish speed, and the relative positions were changed. Germany lost her navy entirely as a result of the war, and in 1922, after a conference on limitation of armament, held in Washington, it was agreed to limit the size of the navies of the United States, Great Britain and Japan in the proportion of 5-5-3, and to scrap vessels built and building in excess of the number agreed upon. This treaty applied only to capital ships, however. The naval treaty of February, 1922, specified the capital ships which each of the five principal naval powers should retain. Thus the British Empire was to retain 22 capital ships, with a tonnage of 580,450; the United States, 18 capital ships, tonnage 500,000; Japan, 10 ships, of 301,320 tons; France, 10 ships, of 221,170 tons; and Italy, 10 ships, of 182,000 tons.

The United States navy was established by Act of Congress October 13, 1775, which authorized the building of two vessels of 10 and 14 guns as national cruisers. A committee of Congress was placed in charge, and shortly after other vessels were provided for and rules for the government of the American navy were made. The first American men-of-war were merchant vessels, hastily and poorly equipped and armed. The first commander-in-chief, Esek Hopkins, opened the career of the new navy by capturing the British naval station at Nassau, Bahamas, with a small squadron, and thus obtained 100 cannon which were placed on the new ships. After the Declaration of Independence, Congress began to build up the navy, and on November 9, 1776, authorized the building of three 74-gun ships, which were the first-line-of-battle ships in the American navy. In 1798 America entered upon a naval war with France to put a stop to the numerous outrages committed by that country upon American shipping. This war lasted two and a half years, and was marked by several victories at sea by American vessels. Peace was made by treaty signed on February 1st, 1801. In the war with England in 1812 the new navy, small in numbers but strong in personnel and spirit, gained world-wide fame, the *Constitution* and *United States* especially gaining victories that aroused popular enthusiasm, which was increased by Commodore Decatur's subsequent victories over the Barbary pirates in the war with Algiers and Tunis. In the Civil War,

the armored vessels *Monitor* and *Merrimac* were developed by the North and the South. The battle between these two vessels on March 9th, 1862, gave a great impetus to the use of armor, which has since become general in all navies. It was not until twenty years later that Congress began to provide for a navy of modern type and strength. The *Maine* and *Texas,* authorized in 1886, were pioneer vessels of battleship type, followed in 1890 by three ships of the *Oregon* type. The war with Spain in 1898, beginning with the destruction of the Spanish fleet at Manila by Admiral Dewey on May 1, 1898, and followed by the naval victory off Santiago, Cuba, caused increased attention to be given to naval affairs in the United States. By 1904 the American navy was second in world importance, but in 1910 Germany rose to second place, and when the European War broke out in 1914 the navies of the United States and France were about tied for third place. But wartime developments, as will be seen, gave the United States navy a position of commanding influence in world affairs.

During the last decade of the 19th century the development of the submarine made great progress and since that time all leading navies have had a number of these useful vessels, which has brought about considerable changes in naval warfare.

Aviation with the employment of both lighter than air and heavier than air craft is likewise being greatly developed in the navy, so that in modern times warfare is carried on under the surface, on the surface and above the surface of the sea. The main reliance of all nations however is the battleship, all other vessels being auxiliary to that type.

When the United States entered the World War, in April, 1917, the navy was immensely increased in size, both in number of ships and in personnel, but most of the additions consisted of raw recruits. On November 1, 1918, just before the Armistice, the United States had 1,800 vessels in full commission, or nearly six times as many as were on the naval lists in 1916. The regular navy list for 1917-18 showed a total of 778 vessels, of which 58 were armored ships, 562 unarmored fighting ships, and 158 non-fighting ships. In addition to the above, 36 interned German ships had been repaired and fitted for service; and about 1,000 privately-owned vessels, including 83 Dutch ships, had been purchased or chartered, and had been or were being fitted for naval use. About 740 of these vessels were put into naval service proper, including offshore and inshore patrol work, troop-transport duty, fleet fueling or provisioning, hospital and other service; and about 300 were put into naval overseas transport service.

On October 1, 1919, the vessel list of the United States navy included 49 battleships, 10 armored cruisers, 20 cruisers of other classes, 7 monitors, 200 torpedo boat destroyers, 86 submarines, 16 gunboats, 14 converted yachts, and about 50 transports, the latter including some of the largest vessels afloat, which were used for bringing American troops home from France.

When the war ended, there were 600,000 officers and men in the United States naval service, or more than there were in all the navies in the world when the war broke out. Before the break with Germany, in January, 1917, the navy had a total of 56,000 officers and men, and the Marine Corps fewer than 12,000. In November, 1918, there were 227,723 officers and men in the regular navy, 290,043 in the naval reserve force, which had been called into active service, 68,376 in the Marine Corps, and 6,771 in the coast guard; a grand total of 592,923, or 31,966 officers and 560,957 men.

Much of the work of the United States navy during the war consisted in patrolling the coasts of North America, Great Britain and France, and in convoying American troopships to and from Europe. In the discharge of these duties the navy made an extraordinarily creditable record. In European waters American battleships, cruisers, and destroyers united with the British fleet and maintained the victorious joint plan of naval strategy. The American navy also had an important part in the work of laying down the mine barrages in the North Sea and the northern waters of the Atlantic Ocean; and for this pur-

pose several bases were established on the British coast. An American naval force was also maintained at Gibraltar, which in conjunction with the British patrolled the Atlantic in that vicinity and was also active in convoying transports and merchant vessels in the Mediterranean.

During the war, 1917-18, the system of training the navy in general paralleled that of the army, and its educational system, like that of the army, underwent great expansion. A large majority of the new additions to the personnel were volunteers. They were given such preliminary and special training as the needs of the navy and their previous education and aptitudes called for. By an agreement between the War and Navy departments, the navy was allotted under the draft law of August 31, 1918, about 15,000 men per month. These received training as circumstances directed, either in the naval section of the Students Army Training Corps, at over 90 educational institutions, or in the various naval-training stations and camps throughout the country. They, as well as the men of the army, became entitled under the law to vocational rehabilitation in case of mutilation in the discharge of duty. After the outbreak of the war, the number of cadets at the Naval Academy at Annapolis was greatly increased by law.

The fighting ships of a modern navy may be divided into a number of types. First in importance are battleships, which take the place of the line-of-battle ships, with numerous gundecks and frowning portholes when navies were composed of wooden sailing vessels. In 1906 England developed a type of vessel of high speed and carrying a large number of high calibre guns. These vessels, called dreadnaughts from the name of the first of the class, may be said to have rendered obsolete all pre-dreadnaught ships, and all present day battleships are developments of the dreadnaught type. Battle cruisers constitute the next type, which are less heavily armed, but of higher speed than battleships. Next come cruisers, scout cruisers, and other vessels, designed for higher speed than the battleship but with less offensive and defensive power. The present tendency is to diminish the number and importance of ships of this type, owing to their feeble defensive power against modern shell fire in comparison with their size. Following these are torpedo boat destroyers and the submarines which played such an important part in German hands during the World War.

But the modern navy requires many auxiliary vessels to supplement its fighting ships. Among these may be mentioned supply ships to bring ammunition, provisions, water, oil, etc., to the fighting fleet; colliers, with special appliances for coaling ships at sea; repair ships or floating machine shops, to make emergency repairs to the fighting craft at sea; hospital ships, to care for the sick and wounded; airplane carriers, or "mother-ships" for naval airplanes or hydroplanes, which in modern practice accompany the fleet.

Navy yards in suitable harbors are needed to build, equip, and repair the vessels of a navy. These yards include in their plant and equipment drydocks, machine shops, storehouses, etc., with a floating equipment of tugs, lighters and other craft. United States navy yards are situated at Boston, Mass.; Portsmouth, N. H.; Brooklyn, N. Y.; Philadelphia, Pa.; Norfolk, Va.; Charleston, S. C.; Mare Island, Cal., and Bremerton, Wash. There are also United States naval stations at Cavite, P. I.; Guantanamo Bay, Cuba; Guam; Key West, Fla.; New London, Conn.; New Orleans, La.; Newport, R. I.; Pearl Harbor, Hawaii; San Juan, Porto Rico; Tutuila, Samoa, and the Virgin Islands. There are torpedo stations at Newport, R. I., and Keyport, Wash., and the United States navy also has submarine bases at Hampton Roads, Va.; Key West, Fla.; New London, Conn.; San Pedro, Cal.; Pearl Harbor, Hawaii; Cavite, P. I., and Coco Solo, in the Panama Canal Zone. There is an ordnance factory at Washington, D. C.

On January 1, 1923, the United States navy had 18 first-line battleships in commission, ranging in size from the *Delaware* and *North Dakota*, of 20,000 tons, to the *Tennessee*, of 32,300 tons. Nine battleships of about 43,000 tons each were then

partially completed, but work was suspended on them pending the outcome of the Conference on Limitation of Armament, and as the result of that conference these ships are marked for scrapping. During the fiscal year 1921-22 the navy placed out of commission a grand total of 376 vessels of all types, including 6 second-line battleships and 173 destroyers, the latter being a useful type of fighting craft in which the United States navy is particularly strong. One hundred and three destroyers, of 1,215 tons each, remained in commission January 1, 1923.

The personnel of the United States navy on June 30, 1922, included 4,436 line officers and 89,513 enlisted men.

Nebraska, a central state of the American Union. It lies on the western bank of the Missouri between the fortieth and forty-third parallels of north latitude. The extreme western boundary of the state is near meridian 104. The width of the state from north to south is 208.5 miles. The length from east to west is 413 miles. The area is 77,510 square miles. The physical features of the state are remarkably simple. The surface rises gradually from the Missouri River westward. The extreme southeastern part of the state is 842 feet above the sea level. Wild Cat Mountain, in Banner County, the highest elevation in the state, rises 5,038 feet above the sea. Aside from the Missouri, the chief river is the Platte, which flows from west to east throughout the entire length of the state. It was called by the Indians, *Nebraska,* meaning "shallow water." Platte is a French name having the same significance. It is a shallow, sandy river without rapids or falls. All the waters of the state find their way into the Missouri.

Characteristics. The state has comparatively little mineral wealth. Lignite coal is found in workable quantities. There are also beds of peat. Limestone is quarried for building purposes. It affords excellent lime and Portland cement. The eastern edge of the state is covered with glacial drift. There is an extensive area of sand drifts or sand hills in the northwest. The bluffs and valleys of the east shelter forests of hard wood. The state is mostly prairie. The eastern part is fertile, comparing favorably with the productive parts of the Mississippi Valley. The west extends into the foothill region of the Rocky Mountains and is lacking in moisture. The entire state seems to be underlaid with an abundance of water which has entered the soil, no doubt, in the foothills of the Rockies. Artesian wells sunk to depths of from 200 to 500 feet seldom fail to reach water. The annual rainfall in the southeastern part of the state is about thirty inches. It falls off toward the northwest about an inch for each fifty miles. The extreme northwestern part of the state has about fifteen inches of rain. The winter is so dry that there is little snowfall. The extremes of temperature may be placed at 102° above and 40° below zero. The southeastern part of the state has the mildest climate; the northwestern the most severe. The mean annual temperature for the year varies from 52° to 46°. The average for July, the hottest month in the year, is about 78°.

Agriculture. Nebraska is preeminently an agricultural state. In order of acreage, the chief field crops are corn, wheat, oats, wild hay, rye, timothy, alfalfa, sorghum, millet, barley, potatoes, clover and broom corn. An annual corn crop of 250,000,000 bushels is expected and about one-fifth as much wheat. The state takes high rank in dairy products. Extensive irrigation canals have been constructed in the western part of the state, aggregating about 3,000 miles in length. They water perhaps a million acres. Land previously considered too dry for agricultural purposes is now enormously productive. That part of the state east of the 100° meridian has acquired a reputation of late for fruit. Apples, plums and cherries do well. Peaches and grapes are raised successfully in the southeastern portion. Strawberries, raspberries, blackberries, currants and gooseberries thrive. Market gardening, especially in the vicinity of Omaha, is an important industry.

Industries. There are extensive stock ranges in the west, on which cattle find their own living the year through. As stated, Nebraska is noted for agriculture rather than for manufacturing. The an-

nual value of manufactured products, however, represents the large total of $143,990,000. Half of this sum is to be credited to the immense packing establishments of South Omaha. Flour milling comes next. Car building, publishing and brewing follow in the order named. The soil has been found particularly well adapted to the raising of sugar beets. The output of beet sugar is about 25,000,000 pounds a year.

Population. In 1920 the population was 1,296,372, an increase of 8.7 per cent. during the decade. The rural population was 31.3 per cent. of the whole as against 26.1 per cent. in 1910. The density of the population per square mile in 1920 was 16.9 as against 15.9 in 1910. There was a decrease in the foreign born whites during the decade. Five cities have a population of over 20,000.

Education. The public schools are in charge of a state superintendent of public instruction with county superintendents in each county. The support is provided by a state school fund, a state tax and local taxes. The amount voted for public school purposes in 1920 was $24,935,000. There are over one hundred consolidated school districts in the state. Instruction in agriculture is given in the high schools as is instruction in manual training and domestic science. For these purposes textbooks are provided by the state. The University of Nebraska and the State Agricultural College at Lincoln are at the head of the educational system. Normal schools are maintained at Chadron, Kearney, Peru and Wayne. There are numerous institutions of higher education under the direction of various universities; all are coeducational. Among these are Bellevue College at Bellevue; Cotner University at Bethany; Doane College at Crete; Grand Island College at Grand Island; Hastings College at Hastings; Union College at College View; University of Omaha at Omaha; Nebraska Wesleyan University at University Place; and York College at York.

The University of Nebraska, at Lincoln, was established by an act of territorial legislature in 1869 and opened in 1871. It comprises a graduate school, a college of literature, science and arts, an industrial college, which includes the schools of agriculture, mechanic arts and domestic science and college of law. A college of medicine is located at Omaha and a school of music and a summer school. The school of agriculture and an experiment station are located on a farm about two miles east of Lincoln. A second school of agriculture is at Curtis, and there are experiment stations at Culberson, North Platte, Scotts Bluff and Valentine, all of which are under the supervision of the university. In 1920 the faculty included 289 members and the enrollment in all departments was 8,200.

Institutions. The charitable and correctional institutions are under the direction of a state board. The school for the blind is at Nebraska City; there is an industrial school for juvenile delinquents at Kearney; an institute for the deaf and dumb at Omaha; asylums for the insane at Lincoln, Norfolk, Ingleside and Hastings; industrial schools for girls are maintained at Geneva and Milford; there is a soldiers' and sailors' home at Milford and Burkett; and the penitentiary is located at Lincoln.

Government. The present constitution was adopted in 1875 and has been liberally amended.

The legislative department comprises a senate and house of representatives; the former cannit exceed 33 members and the membership of the latter is limited to 100; elections are biennial.

The executive department comprises a governor, lieutenant-governor, secretary of state, attorney-general, treasurer, superintendent of public instruction and commissioners of public lands and buildings, all elected for terms of two years.

The judicial department includes a supreme court, district courts, county courts and courts of justices of the peace, with provisions for the establishment of local and inferior courts in accordance with the law.

History. Some suppose that Coronado visited the region now included in Nebraska early in the 16th century, and that Marquette touched upon the territory in 1673 but the latter supposition is without foundation. The first settlement was made in

1807, when a fur trading post was established at Bellevue. In 1819 Stephen Long explored the Platte across the state. His report of the region was such as to give rise to the idea of the Great American Desert. Following the settlement at Bellevue the American Fur Company established posts at Omaha and Nebraska City. Previously to 1821 the region had been a part of Missouri Territory. When Missouri was admitted to the Union, Nebraska was left without a government and was reserved for the Indians. However, whites soon encroached upon the land and the region was crossed by thousands on their way to California after the discovery of gold in that section. A provisional government was organized in 1853 and, from that time to the outbreak of the Civil War, the region was the scene of a struggle between the pro-slavery forces in Kansas and the anti-slavery settlers in Iowa. In 1854 Stephen A. Douglas introduced in Congress his famous Squatters' Sovereignty Bill, which created the Territory of Nebraska, extending its boundaries from the Missouri River to the summits of the Rocky Mountains, tude to British Columbia. Attempts at statehood were prevented by the Civil War, but in 1867 an act for admission of the state into the Union was passed. Since that date the history of the state has been one of steady progress.

During the World War, Nebraska furnished 49,641 men for service and $6,264,760,000 in Liberty and Victory loans and war charities. Forty-nine per cent of her population held membership in the Red Cross.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	76,808
Water area, square miles	702
Irrigated area, acres	442,690
Forest area, acres	100,000
Population (1920)	1.296,372
White	1,279,219
Negro	13,242
Indian	2,888
Foreign born	149,652
Chief cities:	
Omaha	191,601
Lincoln	54,948
Hastings	11,647
North Platte	10,466
Number of counties	93
Members of state senate	33
Members of house of representatives	100
Salary of governor	$2,500
Representatives in Congress	8
Assessed valuation of property	$568,456,926
Bonded indebtedness	None
Farm area, acres	42,338,836
Improved land, acres	24,587,786
Corn, bushels	207,732,000
Oats, bushels	70,054,000
Wheat, bushels	59,875,000
Potatoes, bushels	8,160,000
Barley, bushels	4,915,000
Rye, bushels	1,714,000
Hay, tons	4,712,000
Wool, pounds	1,886,000
Domestic Animals:	
Horses	965,000
Mules	99,000
Milk cows	560,000
Other cattle	2,650,000
Sheep	290,000
Swine	3,063,000
Manufacturing establishments	2,884
Capital invested	$245,256,684
Operatives	36,521
Raw material used	$480,774,122
Output of manufactures	$596,042,498
Potash, tons	15,000
Miles of railway	8,332
Teachers in public schools	15,442
Pupils enrolled	338,310

Nebuchadnezzar, nĕb-u-kad-nĕz′ar, an illustrious king of Babylon. His reign, lasting from 604 to 561 B. C., marks the highest point of the Chaldean kingdom. He overran Syria, carried the Hebrews into captivity, and subjected the Egyptians to the Chaldean yoke. He pushed his conquests far into the northeast, also, building an immense wall against the incursions of his enemies. He beautified Babylon. He dug what is known as the king's canal and a huge reservoir to retain the surplus water of the Euphrates. The so-called Hanging Gardens of Babylon were constructed during his reign to please one of his wives, a Median princess. See BABYLON.

Nebula, a term in astronomy applied to the patches of luminous matter in the sky, which, unlike the stars, present large surfaces of light instead of definite points. Nebulae are of two kinds, green and white. The green nebulae are fewer in number but larger in size, and are thought to be made up wholly of gaseous matter. The white nebulae, on the other hand, have a continuous spectrum, and seem to contain both

solid and gaseous matter. Two distinct nebulae are visible to the naked eye, the one in Andromeda and that in Orion. The one in Orion is found to include the whole constellation, and the constant changes that it undergoes point to the fact that its gaseous matter seems to be condensing, and as it joins to the stars it suggests the formation of a universe out of the plastic material. The nebular hypothesis of Laplace accounts for the development of the solar system and cosmic evolution by showing that through rotation a mass of formless matter assumes the form of a flattened sphere, and that when this bulk contracts, it leaves behind a part of the contracting mass. From this thrown-off mass planets might be formed. This, however, is hypothesis, not scientific fact.

A great deal has been done in recent years in photographing nebulae, and as a result much definite information has been acquired. They are interesting heavenly bodies in themselves, aside from the immense amount of speculation to which they have given rise concerning the origin and evolution of the universe. The Milky Way contains large areas of green nebulous matter, and this, together with the countless stars set in this luminous background, causes the whitish appearance which gave rise to the name.

Nebular Hypothesis, in astronomy, a theory of the formation of the solar system. It was propounded originally by Swedenborg and was passed on by Kant to La Place, "the French Newton," who elaborated the theory and gave it currency. It is associated usually with the name of La Place. According to this theory the material of which the present solar system—sun, planets, moons, and asteroids—is composed was distributed in a vast gaseous mass extending beyond the orbit of Neptune. Under the influence of gravitation and motion the mass contracted, throwing off planet after planet, the remotest planet first. The sun, at the center, is what was left after the mass became reduced sufficiently to hang together. La Place was of the opinion that each planet disengaged itself from the central mass in the form of a ring, such as now surrounds the planet Saturn. The moons of each planet are supposed to have been thrown off from the planets around which they revolve. The entire theory is undergoing study at the present time. It has been suggested, for instance, that our moon and the other moons are captured planets, or comets, that is to say, that they formerly described orbits about the sun, but that they came so near the planets they now attend, that they were captured, drawn within the influence of their respective planets, and thus became satellites. See LAPLACE; ASTRONOMY.

Necker, Jacques (1732-1804), a French minister of finance. He was a native of Geneva. He became a member of his uncle's banking house in Paris and acquired a fortune. He married a gifted Swiss lady, the same whom the historian Gibbon desired to wed. Madam Necker's salon, that is to say, parlor, was the resort of the literary people of the day. Buffon was a constant visitor. Franklin was a frequent caller. When Gibbon visited Paris, he did not hesitate to renew an old-time acquaintance. Necker was a writer of no mean caliber, especially on subjects of finance. Madame Necker was celebrated as a beauty, wit, and woman of learning. The famous Madame de Staël was their daughter. Madame Necker was ambitious and urged her husband to sell his banking interests for a chance at the game of politics. In 1777, during our Revolutionary War, Necker was made minister of finance. He discharged the duties of the position with fidelity, gaining the favor of the people rather than that of the king. Marie Antoinette disliked him. He was twice dismissed and as often recalled. He tendered his resignation finally in 1790, in the early years of the French Revolution, and retired to his country home near Geneva. See FRENCH REVOLUTION.

Necropolis, a Greek word signifying the city of the dead. It was applied to any city cemetery, but especially to the suburb in Alexandria, Egypt, in which the dead were embalmed and laid away.

Nectar, in Greek mythology, the drink of the gods on Mount Olympus. Ambrosia was their food. Homer describes nectar as a fragrant, sweet, red drink, resembling

wine. It was tendered by Hebe and conferred immortality. By the botanist and bee-keeper the term is given to the sweet juice secreted by many flowers. It is the material of which bees make honey. It is stored up in glands known as nectaries, found usually at the base of the stamens. Sometimes the nectar seems to ooze from a surface, having no special glands. So far as plants are concerned nectar allures bees, wasps, bumblebees, and other insects. In their search for nectar they become dusted with pollen and carry it to the pistils of near-by flowers of the same kind, effecting what is called cross-fertilization. See HONEY; AMBROSIA.

Nectarine. See PEACH.

Needle, a slender steel instrument having a sharp point at one end and an eye at the other. It is used for drawing a thread through a fabric. Even the rudest nations have substitutes of bone or other material. The American Indian had bone needles and awls with which to sew his moccasins and leggings. Needles are, no doubt, of great antiquity. They are found among the relics of primitive man everywhere. The earliest literature and the earliest drawings hint at garments and embroidery that could not be made without the aid of the needle. Nuremberg was noted for needles as early as 1370. The industry is said to have been introduced in England about 1560. Needles were made formerly by hand, but of late ingenious machines have been invented. Needlemaking is an important branch of manufacturing. According to the last United States census, our annual output is valued at $1,027,949. Needles are made from steel wire of superior quality. Great care is taken to produce wire of uniform size. It is first cut into pieces long enough for two needles. A point is then ground at each end, the center is flattened slightly, two eyes are punched near together, and the two needles are then cut apart. The eyes are polished by stringing the needles on fine steel or flax tape coated with emery powder. Counting the clipping, sharpening, punching, cutting apart, polishing, heating, boiling in oil, washing, scouring, bluing, and other steps, needles pass through about two dozen processes before they are wrapped up finally in little envelopes ready for the trade. All is done by machinery. The process of making sewing-machine needles is not essentially different, except that the eye is made in the point, and is provided with a groove on each side for the protection of the thread. About 1905 a self-threading needle was put on the market. The end of the needle containing the eye is split. By pulling the thread into a notch it spreads the head sufficiently to slip into the eye. See PIN.

Negligence, in the legal sense, omission or failure to exercise that degree of care which the law requires for the protection of those interests of other persons which may be injuriously affected by the want of such care. Three degrees of negligence are recognized by the courts, namely, slight negligence, ordinary negligence, and gross negligence. Slight negligence is the failure to exercise a high degree of care, usually measured by reference to "that diligence with which a circumspect and thoughtful person would attend to his own interests." Ordinary negligence is legally defined as the failure to exercise ordinary care, usually measured by "the degree of care which a man of common prudence and capable of governing a family takes of his own interests." Gross negligence is the failure to exercise even slight care, and is usually measured by reference to "that degree of care which every person of ordinary sense, however inattentive, takes of his own interests."

If negligence on the part of an individual directly results in injury to the interests of another person, who did not by his own negligence contribute to the result, it is known as actionable negligence. If the failure to exercise due care is willful, liability is incurred either with or without contributory negligence on the part of another; but the failure of care may still be treated as mere negligence, at the option of the person injured, so far at least as concerns the liability of the person guilty of it, and in some cases also for the purpose of holding his employer liable. By a rule of law which obtains in some states, the person injured may recover notwithstanding his own negligence if it was slight

as compared with that of the defendant, or comparative negligence. Contributory negligence is negligence on the part of the person injured, which contributed to producing the injury.

Negotiable Paper, a term applied to any written evidence of debt which may be transferred by indorsement or delivery, so that the transferee or holder may sue on it in his own name with like effect as if it had been made to him originally; sometimes called commercial paper, but the legal term is "negotiable instruments." Bonds, bills of exchange, promissory notes, drafts, or checks, payable to the order of a payee or bearer, are negotiable paper.

Negotiable instruments are written contract obligations which can be transferred from hand to hand like coined or paper money. They are instruments of trade or credit; that is, they are a substitute for money or an evidence of a postponed debt; and may be issued by private persons, by banks, or by the government.

Practically every written contract or agreement which involves the payment of money or property, is negotiable in the sense that the owner can sell it to another and that the purchaser can enforce it to the same extent that the original owner could if he had not assigned it. Mortgages, contracts for the sale of real estate or personal property, building contracts, leases, etc., would be enforceable in the above sense, however, but are not usually included in the term "negotiable instruments."

The material difference between a non-negotiable instrument and a negotiable instrument is that the party to the non-negotiable instrument who has agreed to pay money or property under it may, when the money or other consideration is demanded by a purchaser, set off against it any claims that he has against the original owner, which he could have set off if it had not been assigned; while the bona-fide purchaser, before maturity, of a negotiable instrument, can enforce it for its full amount against the maker, regardless of any counterclaim or defenses that the maker has against the original owner.

This is the feature of negotiable paper which makes it valuable as a substitute for money. In the hands of an honest purchaser, or "holder in due course," it can be collected whether it was binding in the hands of the original holder or not. Thus, a negotiable instrument, such as a promissory note, given by A to B, without consideration, cannot be collected by B, but if it is bought in good faith by C, he can enforce payment from A. This peculiarity is legally necessary in order that such instrumenfts may be readily transferable. A business man would not care to buy a note he knew nothing about, if by some irregularity in its execution he might lose the amount it represents.

Paper to be negotiable must conform to the following requirements: (1) It must be in writing and signed by the maker or drawer; (2) must contain an unconditional promise or order to pay a sum certain in money; (3) must be payable on demand, or at a fixed or determinable future time; (4) must be payable to order or to bearer; and (5) where the instrument is addressed to a drawee, he must be named or otherwise indicated therein with reasonable certainty.

Negro, from the Latin *niger, black,* is the name applied to all the races of Africa except the Egyptians, Abyssinians and Berbers; some authorities hold also that the Hottentots (which see) are not properly Negroes. Almost all ethnologists consider the Soudanese the best representatives of the Negro people.

The chief characteristics of the Soudanese—and therefore, with some modifications, of all Negroes—are a dark-brown skin, long—dolicocephalic—head, broad, flat nose, strongly everted lips, heavy, projecting jaws, black, crisply curling hair, greater than average stature, long arms, thin legs and a broad, flat foot with a low instep.

Outside of Africa are many tribes the members of which present to the ethnologist still unsolved difficulties. They present, in all cases, some features corresponding closely to those of the Soudanese, and some that do not correspond. The result is, that in a consideration of the Negroes, it is usual to take into account

only those peoples who inhabit Africa from the Soudan to the Cape of Good Hope, and the descendants of these, resident chiefly in North and South America.

POPULATION. Though the difficulties of taking a census of the Negroes of Africa are great and an accurate census is impossible, careful estimates are made from time to time. The latest estimate gives 139,000,000 as the number of Negroes in Africa. The fourteenth census gives the Negro population of the United States as 10,463,131, an increase of 635,368 in the decade 1910-1920. The increase was in the main natural. By geographic divisions and states they were distributed as follows:

Division and State	Number
New England	79,051
Middle Atlantic	600,183
East No. Central	514,554
West No. Central	278,521
South Atlantic	4,325,120
East So. Central	2,523,532
West So. Central	2,063,579
Mountain	30,801
Pacific	47,790
Maine	1,310
New Hampshire	621
Vermont	572
Massachusetts	45,466
Rhode Island	10,036
Connecticut	21,046
New York	198,483
New Jersey	117,132
Pennsylvania	284,568
Ohio	186,187
Indiana	80,810
Illinois	182,274
Michigan	60,082
Wisconsin	5,201
Minnesota	8,809
Iowa	19,005
Missouri	178,241
North Dakota	467
South Dakota	832
Nebraska	13,242
Kansas	57,925
Delaware	30,335
Maryiand	244,479
Dist. of Columbia	109,966
Virginia	690,017
West Virginia	86,345
North Carolina	763,407
South Carolina	864,719
Georgia	1,206,365
Florida	329,487
Kentucky	235,938
Tennessee	451,758
Alabama	900,652
Mississippi	935,184
Arkansas	472,220
Louisiana	700,257
Oklahoma	149,408
Texas	741,694
Montana	1,658
Idaho	920
Wyoming	1,375
Colorado	11,318
New Mexico	5,733
Arizona	8,005
Utah	1,446
Nevada	346
Washington	6,883
Oregon	2,144
California	38,763

The Negroes who were sold into slavery in America were almost entirely members of the Bantu tribes of the Soudan; they are the most intelligent and capable of all the black people.

NEGRO ADVANCE IN THE UNITED STATES. After slavery in the United States the Negro began to advance mentally, morally, socially, and as year follows year the advance becomes more rapid. In the South he turned to agriculture, while in the North he became an industrial worker. The Negro of the far South has remained more stationary than the Negro of the states contiguous to the North, and the distinction between the agriculturist and the mechanic is immediately noticeable according to which side of the Mason and Dixon Line the observer is on.

In 1920 there were 925,708 Negro farmers in the United States, working 43,785,988 acres of land. The greater part of these are in the South. During the decade 1910-1920 there was a greater migration northward than in any similar period of the Negroes' residence in the United States. To 1910, 2,113 Negroes who were born in South Carolina had migrated to Pennsylvania but by 1920, 11,624 South Carolina born Negroes had migrated to that state. Those migrating from Georgia to Pennsylvania increased from 1,578 by 1910 to 16,196 by 1920; those migrating from Florida to Pennsylvania increased from 393 by 1910 to 5,370 by 1920; those from Alabama to Ohio increased from 781 by 1910 to 17,588 by 1920; those from Mississippi to Illinois increased from 4,612 by 1910 to 19,485 by 1920; those from Louisiana to Illinois increased from 1,609 by 1910 to 8,078 by 1920. It is significant that the greatest numbers mi-

grated into three highly industrialized states—Pennsylvania, Ohio and Illinois.

These migrations were partly induced by industrialists who were in need of more or cheaper common laborers and were partly the result of a desire on the part of the Negro to leave agricultural pursuits for other lines of industry. While the Negro fresh from the far South usually becomes a common laborer in the North, many of the northern Negroes, on the other hand, have developed into skilled mechanics, have entered the clerical field and the United States civil service, or have gone into business.

Education of the Negro. While in the southern states Negro illiteracy is high —38.5 per cent in Louisiana to 15.3 per cent in West Virginia—the fact still remains that in the less than 75 years that have elapsed since the close of the Civil War, the Negro has made commendable intellectual progress. In New York, for instance, the Negroes are only 2.9 per cent illiterate, a better average than can be shown for the native white population of some other states of the Union.

In the southern states separate schools for Negroes are maintained, but these are becoming yearly more adequate and the standard is constantly increasing. Almost every state now (1923) offers normal training, technical education and university training for Negroes.

One of the greatest Negro educators that the United States has had was Booker T. Washington (see Washington, Booker T.). He was a graduate of Hampton Institute, founded by General S. C. Armstrong, and was himself the founder of Tuskegee Institute, one of the most famous Negro institutions in the United States. There are also, besides the public primary and higher schools, a good number of private and denominational institutions for the education of the Negro. See Hampton Normal and Agricultural Institute; Tuskegee Normal and Industrial Institute; Slater Fund; Dunbar, Paul Laurence; Douglass, Frederick; Bureau Contraband; Emancipation Proclamation.

Nehemiah, a Jewish leader, the son of Hachaliah, (Neh. i:1), and a brother of Hanani. He was cupbearer to Artaxerxes Longimanus, emperor of Persia. He mourned over the fact that Jerusalem, the place where his ancestors were buried, was laid waste, and asked permission of the emperor to rebuild the city. He was given a leave of absence to carry out his design. He was equipped for his undertaking with letters from Artaxerxes, which were intended to secure cooperation in his plan. Nehemiah, however, met with opposition from the Samaritans and others.

An inscription in early Hebrew was discovered in 1880 in the tunnel cut through the rocks which conducts the waters of the Virgin's Spring into the pool of Siloam. The deciphering of this inscription has given information regarding the times of Nehemiah and of the rulers who reigned during this period. The site of Jerusalem was only 50 acres, but it contained a population of over 15,000 Jews.

The book of Nehemiah is one of the historical books of the Old Testament. The period it covers is from 445 to 432 B. C. It is founded on the memoirs of Nehemiah, but it is believed to contain much extraneous matter. In the Jewish canon the books of Ezra and Nehemiah were treated as one. Origen was the first to separate them, calling them the first and second books of Esdras. Jerome gave the name of Nehemiah to the second one. This last named book is divided into four parts: chapter i:vii forming a continuous narration by Nehemiah; chapter viii:X probably by another author; chapter xi: xii:26, from Nehemiah's pen, as is the fourth section, xii:27, to the end of the book, except for some verses of later date. The portions written by Nehemiah were of date 433-432 B. C. The language of the book is Hebraic with some Aramaeisms, and what were believed to be Persian words occuring here and there, have now been found to be Babylonian.

Nelson, British Columbia, the capital of Kootenay District, is situated at the end of navigation on the west arm of Kootenay Lake. Nelson is 513 miles east of Vancouver and 199 miles northwest of Spokane, Washington. It is served by the Great Northern and several branches of

the Canadian Pacific railroads. Hydro-electric power is an aid in the manufacture of sash and doors, beekeepers' supplies, matches, clothes pins, furniture, lumber, boxes, shingles, motor boats, mattresses, iron, cigars and ships. In the surrounding country zinc, coal, lead, gold, silver, fire clay and marble are found, and fruit and cereals are raised.

Nelson has six churches, two public primary schools, a high school, a business college, a convent school and a library. The town is popular with fishermen and hunters of big game. In 1921 the population was 5,236.

Nelson, Horatio (1758-1805), an English naval commander famous in the Napoleonic wars. He was born at Norfolk, England, September 29, 1758. He entered the English navy at the early age of twelve. While still a lad he saw service in the Arctic seas, in the waters of Central America, and in the West Indies.

In 1805 he was appointed to the command of the British fleet in the Mediterranean. The French fleet got away in March and sailed for the West Indies. Nelson followed. He was given the slip again, but gave chase pluckily back to the coast of Spain. October 21st he overtook the combined French and Spanish fleet off Cape Trafalgar. He gave battle at once, practically annihilating the enemy. This victory was a serious blow to Napoleon. He had established an army of 200,000 troops at Boulogne for the invasion of England, a project now rendered utterly impracticable.

Nelson fell during the engagement. His remains were taken home and interred with honor in St. Paul's Cathedral. One of the finest open places in London was named Trafalgar Square in commemoration of the great victory. In the center of the square rises a massive granite column 145 feet in height. It is a copy of one of the Corinthian columns of the Temple of Mars, the avenging god of war, at Rome. The column is crowned with a statue of Nelson, seventeen feet in height. The pedestal is adorned with reliefs cast with the metal of the French cannon captured at Aboukir. One relief commemorates Aboukir, another Copenhagen, a third Trafalgar, the fourth St. Vincent. Nelson's last words, "England expects every man to do his duty," appear in letters of bronze. See TRAFALGAR.

Nelson River, the largest river in Manitoba, takes its rise in Lake Winnipeg, and after a winding course of about 400 miles, which is frequently retarded by rapids and falls, empties into Hudson Bay. Its current is swift, and it carries a great volume of water.

This river is navigable for small craft for about sixty miles below Lake Winnipeg. Its lower course is navigable for small steamers, but since the course is interrupted from this point by numerous falls and rapids, only canoes can come through. At the mouth of the river is Port Nelson, which is the terminal point for the Hudson Bay Railroad. An old trading post, York Factory, is located in this vicinity. The drainage basin of this river system contains an area of 370,800 square miles. There are several small lakes along its course.

Nemean Games. See OLYMPIC GAMES.

Nemesis, in Greek mythology, the goddess of retribution. She was the daughter of Erebus and Night, or, according to some accounts of Zeus and Necessity. She represented the righteous anger of the gods.

Nennius, nĕn′i-us, a British historian of the eighth century. Little is known about him. He is said to have lived in Wales and to have been the author of *Historia Britonum.* This work gives an account, mythical of course, of the origin of the Britons, of the invasions of the Romans, and of the Saxon settlement. It includes also the stories of King Arthur, and especially a description of the twelve great battles in which Arthur overcame the Saxons. See ARTHUR, KING.

Nepos, Cornelius (about 99-24 B.C.), a Roman historian. A remnant of his *Lives of Noted Men,* written in simple language, has been used for generations as a beginner's book in Latin. See LATIN.

Neptune, the Roman god of the sea. See POSEIDON.

Neptune, the outermost of the known planets. Named for the Roman god, Neptune. According to Bode's Law, stated in

the article on PLANETS, a new planet was to be expected beyond Saturn. The behaviour of Uranus also indicated the presence of a disturbing influence. An astronomer in Paris computed the probable size and position of the planet and wrote a friend in the Observatory of Berlin when and where to look and what to look for. As the result a new planet was discovered September 23, 1846, and the claim of astronomy as an exact science was strengthened. As a matter of fact Jupiter is not so far from the sun as Bode's Law would require, and it has been suggested that the breaking down of Bode's Law indicates that Neptune is the last planet and that no planetary bodies exist beyond its orbit. Neptune is so far from the sun that a person on Neptune could not see the sun clearly. It would seem smaller than Venus does to us. At that distance the light of the sun must be dim,—midway between our sunlight and moonlight. Although the volume is fifty-three times that of the earth, Neptune is so far from us that it cannot be seen except with a telescope. Neptune has one satellite. See PLANETS.

This working backward from the perturbations experienced by Uranus to the cause which produced them is justly regarded as one of the greatest scientific achievements of the human intellect, and is worthy of note that we are approaching the time at which it may be repeated, for Neptune now behaves much as did Uranus three quarters of a century ago, and the most plausible explanation which can be offered for these anomalies in its path is that the bounds of the solar system must be again enlarged to include another disturbing planet.—Comstock, 1901.

Nereids, nē′rē-ĭdz, or **Nereides,** in Greek mythology, water nymphs, daughters of Nereus and Doris. They belong to the lower order of divinities, but had the gift of prophecy and the power of assuming different shapes. There were fifty Nereids. They were the nymphs of the Mediterranean. See NYMPHS.

Nernst, Walther (1864-), a German chemist and physicist. He was born in Briesen, West Prussia, studied in the Universities of Zurich, Berlin, Gratz and Würzburg, and in 1889 became lecturer in physical chemistry in Berlin. He accepted the chair of chemistry in Göttingen in 1891, and four years later he established an institute for physical chemistry in the same place. His studies in electricity led to the invention of the Nernst incandescent electric lamp. This lamp has economic value and produces excellent illumination. A bar of magnesia takes the place of the carbon filament of the ordinary incandescent lamp, and its use and value becomes nil only at its melting point. Nernst has published a number of works in his chosen field.

Nero (37-68 A. D.), one of the emperors of Rome. He succeeded Claudius in 54 A. D. He was well educated for his time, one of his instructors being no less than the philosopher Seneca. He ruled at first with moderation, but soon broke over all restraint. In 64 A. D., the "Great Fire" laid waste a good half of Rome. The flames surged through the crowded streets for six days and nights. A rumor got abroad that Nero ordered the fire set to clear the way for a new city. The suspicion has taken root in a popular saying that "Nero fiddled while Rome burned." Nero took the greatest pains to avert suspicion. He laid the blame on the new sect of Christians and ordered one of the cruelest persecutions ever known. Victims were even dipped in pitch, it is said, and allowed to burn at night like torches for the delight of the populace. There is no need to suspect any one of incendiarism, however, to account for a destructive fire in a great city flimsily built and wholly without fire-protection. Nero did make good use of the opportunity afforded to rebuild the city. He proceeded promptly to lay out broad streets where a maze of crooked lanes had been, and to erect imposing buildings where hovels had stood. Among other public buildings was the Golden Palace for his own use. He amassed wealth by putting rich people to death and confiscating their property. Even his old teacher, Seneca, was ordered to commit suicide, his crime being the possession of coveted wealth. Nero's conduct was so notorious that the legions revolted. The Senate ordered him scourged to death. To avoid arrest he took his own life.

Nest, in natural science, the bowl-shaped or purse-like receptacle in which birds and other animals rear their young. Some rodents, as mice, dormice, and many squirrels

NERO AT THE CIRCUS

From the Painting by H. Siemiradski

construct nests with care. The form of a hare may be regarded as a nest. Some fishes, as the croppy and stickleback, make nests for their eggs. Even the salmon and trout work up sand into shape to protect their eggs. Many insects construct nests for their eggs. The comb of the bee, wasp, and hornet may be regarded as composed of nests. Ordinarily speaking, however, the nest is the characteristic home of the bird during the season when eggs and young require care.

It is difficult to classify birds' nests. Some of the lower seafowl, as the murre, guillemot, and auk lay their eggs singly on rocky ledges. Although these eggs lie on a bare, rocky floor so thick that one can scarcely step between them, and are as alike as peas, the apparently stupid mothers seem to know each her own egg. Once in a while a fracas breaks out with the result that areas of eggs are swept into the sea. The emperor penguin holds its egg on its foot. The puffin, unlike its fellows, digs a tunnel several feet into a sandbank. Gulls and terns take the pains usually to collect a little grass and seaweed. Grebes and mudhens form nests of floating, decayed vegetation. The eggs lie in wet muck. Ducks, geese, and swans, on the other hand, seek a dry spot hidden in bushes and grass, and construct a substantial nest, lining it with down from their own breasts. The eider duck in particular is so liberal in the use of down that the nests have a commercial value. The wood duck, the butterball, and even the hooded merganser nest in hollow trees. The loon nests near the water's edge, so as to be able to glide off like a boat into the water.

Wading birds and shore birds also differ greatly in their nesting habits. Many snipes lay their eggs in the merest depression. The plover arranges short bits of weed stems, so as to point toward the center. Herons form colonies and build platforms of sticks in trees or bushes. Bitterns hide their nests snugly in grassy sloughs. The flamingo builds a column of mud ten or twenty inches high and nests in the top of it. Failing trees, the stork builds a nest of sticks across the top of a chimney.

Birds of prey usually build bulky nests of sticks. Vultures nest carelessly under logs or bushes or in hollow stumps. The condor builds on an inaccessible cliff in the region of the clouds. Eagles use the same nest from year to year, adding additional sticks. The golden eagle prefers a rocky cliff; the bald eagle a tall tree. Each hawk and kite has its own kind of a place in which to build, but the species differ widely. The marsh hawk or hen harrier builds on the ground amid bushes or grass. The peregrine falcon or duck hawk prefers a cliff or hollow tree. The osprey wants to build on a broken stub thirty feet from the ground. Seventy feet suits the chicken hawk better. The sparrow-hawk enlarges a woodpecker's hole in a high stub. The barn owl likes an old tower or steeple. The screech owl is pleased with the hollow limb of an apple tree. The great horned owl saves labor by using an old crow's nest. The saw-whet crowds into a woodpecker's hole. The snowy owl nests on the ground in the arctic barrens. The burrowing owl makes a nest of pieces of buffalo "chips" or dried cow dung several feet within the burrow of a prairie dog or badger.

The kingfisher is also a burrower; her nest is at the end of a tunnel in some dry bank. The woodpeckers, sapsuckers, and flickers cut holes in dead trees. Failing these, old telephone poles answer the purpose. The nuthatch, the titmouse, and the chickadee nest in knot holes or deserted holes made by larger birds.

The chimney swift builds a bracket of twigs and gluey saliva half way down the inside of a chimney. The swift of Indo-China builds a similar nest wholly of saliva on rocky walls and in caverns. This is the edible nest of the Chinese. The species of the swallow tribe have various notions. The purple martin is partial to a box on a pole or to crevices in a cornice. The cliff swallow has left its cliff and builds a mud bracket under the eave of a barn or other building. The barn swallow builds inside on a rafter or beam. The bank swallow still tunnels into clay cliffs.

Quails, partridges, pheasants, prairie chickens, ptarmigan, blackcock, and, in fact, grouse of all sorts nest on the ground. The same is true of the wild turkey. Wild pigeons and doves build flat, careless nests of twigs on the spreading branches of trees

NESTS.

1. Mexican cacique. 2. African shadow-bird or umbrette. 3. Long-tailed titmouse. 4. European goldcrest or kinglet. 5. Australian bower bird. 6. European coct.

or bushes; the mourning dove chooses a branch usually about ten feet or less above the ground. The passenger pigeon builds higher.

The bluejay weaves roots and grass together in the crotch of a tree about twenty feet from the ground. Of a dozen jays' nests in a grove there will not be five feet variation in height. The common crow, a relative, chooses a crotch as uniformly ten feet higher, and lines her stick nest with fine shreds of grape bark, moss, and grass. The robin, in the same grove, builds its nest of grass and mud five feet lower than the jay.

Of familiar birds, the king bird is least set in her own way. The nest is built with care of weed stalks and grass, and is lined with fine hair, moss, thistledown, and lint; but the intersection of two fence rails and a limb twenty-five feet above ground seem to answer equally well. The whole flycatcher family seems more or less indifferent as to elevation.

Most blackbirds build deep, well constructed nests of grasses, supported by reeds or bushes standing in marshes. The cowbird, an unworthy member of the family, leaves its eggs in the nest of some songbird. The bobolink nests on the ground in meadows. The meadow-lark builds an overarched nest under shelter of a tuft of grass. The orchard oriole hangs a pocket of grass from the tip of a branch fifteen feet from the ground. The Baltimore oriole, the pride of the blackbird family, weaves a pouch of grass, hair, strings, and roots and hangs it from a limb twenty feet higher. It does not object to a tree top sixty feet high.

The grosbeaks, the purple finch, the cross bills, red polls, goldfinches, cardinal birds, indigo bunting, and dickcissel build hemispherical nests in bushes or trees, from five to thirty feet above the ground, each species at its own height. Most American sparrows build similar nests on the ground.

The nests of perching birds, though of a general type, possess an individuality as marked as that of the birds themselves. Size, shape, material, workmanship, method of attachment, and size of twig enable the expert to identify a nest usually at a glance. It is useless to look for certain nests outside of an evergreen tree, and as useless to look for others in one. How it is that a bird a year old, with no experience and with no instruction in nest-building from her parents, can build a nest at all, much less choose a site and build a nest precisely like that in which it was fledged a short summer ago, is one of the puzzling questions of animal instinct.

Naturalists describe many curious nests. The tailor bird forms a nest by sewing the edges of growing leaves together with grass. The weaver birds associate and form a rainproof roof of leaves, under which they all build. The brush turkey of Australia amasses a heap of several tons of leaves apparently for the warmth produced, for the leaves heat like a hotbed.

The most extensive collections of birds' nests are to be found possibly in the Natural History Museum of South Kensington, London, and the American Natural History Museum in Central Park, New York.

See BIRD.

Nestor, in the legend of Troy, a Greek hero—"The wisest of the Greeks." He was king of Pylos. He was an old man when the expedition against Troy set sail, but he insisted on leading his own force of twenty ships. He enjoyed a high reputation for courage, wisdom, and eloquence. He took no part in fighting, but played the part of the aged counselor without whose advice no step of importance could be taken. The term is still used in modern politics. After his retirement from the presidential office, James Madison, for instance, whose advice was sought by the younger leaders, was called the Nestor of his party.

See TROY.

Net, an open fabric used for catching animals alive. Nets have either the form of a bag, in which case they are used after the fashion of a scoop, or else they are extended curtains, in which animals become entangled. Nets are of great antiquity. They were used by primitive people not only to take fish, but to entangle birds and wild animals. A net thrown over a lion, for instance, so entangled the beast that the native hunters were able to dispatch him with their spears. The net used by children in catching butterflies is a familiar

NESTS.

1. Mountain titmouse. 2. An eagle's eyrie. 3. Weaver bird. 4. Garden warbler. 5. Clay nest of European oven bird. 6. Edible nests of the Asiatic cliff bird. 7. Tailor bird. 8. Java tree-swift.

example of the bag net. Material used for such a net needs only to be light and strong and to allow the air or water to pass through it without resistance.

Fish nets are constructed frequently on the plan of a pocket. Such nets are set in the water in such a way that fish running into them are unable to find their way out. The drag net, used by fishermen, is a huge pocket drawn along the bottom of the sea. The casting net is a circular net weighted at the margin. This the fisherman throws out so as to cover a circular space of water. The weighted edges drop at once, forming a sort of pouch around any fish that may happen to be under the net.

Ordinary fishing nets, however, are entirely without pockets. They may be made of any strong twine that does not rot readily in water. The cords cross each other at right angles, and are tied with fixed knots that will not slip. The intervening spaces are called meshes. The strength of the cord and the size of the mesh are adapted to the strength and size of the fish which it is designed to catch. This sort of net is usually weighted along one edge with pieces of lead and buoyed at the opposite edge with pieces of cork, causing the net to assume a vertical position in the water somewhat like a wire fence. In attempting to pass through the net the fish become entangled, so that they can go neither forward nor backward. When the net has been set for a sufficient length of time, the fishermen pass along with a boat, raise the net out of the water, and take out the fish. If the fish are too large for the net, they cannot work their way into it and are not caught, or they may be so large as to break the net. On the other hand, fish too small for the net pass through the meshes without becoming entangled. In seining for some kinds of fish the net is allowed simply to float on the surface of the sea.

Nets vary in size from the minnow net, which affords sport for the urchin, to nets five miles in length. The fisherman's net is a valuable piece of property. Sometimes a few swordfish darting through a net will do more damage than an owner can repair in a week's time. In order to prevent rotting, nets should either be kept under water or else spread out to dry.

See MACKEREL; TROUT; FISH.

Netherlands, The, a kingdom of western Europe. The name means Lowlands. The kingdom includes not only the provinces of the country formerly known as Holland but adjacent territory as well. It occupies the territory about the mouths of the Rhine and the Zuider Zee (zī'der zē). It is built chiefly of soil brought down from the Alps by the Rhine.

DIKES. With the exception of a number of sand hills along the coast formed by the wind and others near the Danish frontier, the Netherlands may be described as a country without mountains, rocks, or springs. The greater part of the surface has, in fact, been reclaimed from the ocean by building immense earthen walls or dikes, and pumping out the water within. These dikes are of great width and not infrequently from forty to sixty feet high. They cross each other at various angles, forming a network. The areas of meadow and field thus inclosed are called polders. The railways and roads, as well as the canals, follow the tops of the wide embankments. People at work in the fields are surrounded by high embankments along the tops of which they can see trains or the masts of canal boats against the sky. Passengers in canal boats look down as from a railway embankment upon cattle in the meadows and people in the fields on either side. Sixty millions of dollars have been expended in the construction of these dikes and in pumping out water. Public pumps propelled by windmills are one of the features of the Dutch landscape. Over ninety lakes have been drained in this way. The government has of late begun the reclamation of large portions of the Zuider Zee, the waters of which are very shallow and cover mud flats of enormous productivity. There is, of course, constant danger that the sea may break through the embankments and flood the country within. Despite the utmost watchfulness this has happened more than once. Seventy villages and 100,000 people were swept away by an inundation in the thirteenth century. There are about 2,000 miles of canals. The greatest is a ship canal 26 feet deep and 197

wide, leading from the North Sea to Amsterdam. Others are almost as large.

CLIMATE. The winters of Holland are much colder than those of Great Britain. The canals, being practically without current, are frozen over with regularity and afford fine skating. Everybody skates. As might be expected from a country lying so low, the summer is foggy. It is said that nine days out of ten are cloudy or foggy.

AGRICULTURE. The soil of Holland is composed of fine silt brought down by the rivers or washed back by the sea. It is exceedingly fertile. Wheat is raised in parts of the country where the sky is brightest. The chief field crops are wheat, rye, barley, oats, potatoes, buckwheat, flax, and beets. The Dutch are famous raisers of vegetables and flowers. Flowering bulbs, as tulips, lilies, etc., form an important article of export, but the annual export value has decreased during the present century. Vegetable and flower seeds are raised for sale to other countries. Bees and poultry are a source of wealth. Holland is one of the great dairy countries of the world. Enormous quantities of cheese and butter are exported to the English and German markets. About 6,300 ships and 28,000 seamen are employed in fishing for oysters, herring, and other fish in the North Sea.

MANUFACTURES. The Netherlands are not noted for manufactures. The country has a reputation for the fine linen known as holland, and for woolen cloth. Schiedam is noted for distilleries. The large pipes for which the Dutch are noted are made at home. There are manufactures of pottery, brick, tile, and glassware. Shipbuilding is carried on at some of the seaports. The extreme southeastern part of the country next to Belgium yields a supply of excellent coal.

COMMERCE. The merchants of the Netherlands carry on an extensive commerce; chiefly, however, with the colonial possessions in the East and the West Indies. These possessions embrace an area of 783,000 square miles, and have a population of 47,000,000, about seven times as large as that of the Netherlands itself. From Java, Sumatra, Borneo, the Celebes, and other East Indian possessions, rice, coffee, sugar, indigo, pepper, tea, tobacco, oil-nuts, dyestuffs, pearls, tin, and other articles are imported. Cacao, bananas, coffee, rice, Indian corn, rum, and molasses are imported from Dutch Guiana and the islands owned in the West Indies.

INHABITANTS. The people of the Netherlands are of German stock. By way of distinction from the Germans of Saxony, Prussia, etc., they are called Low Germans, or Dutch. The people are, as a class, industrious and contented. The Dutch housekeepers are famous for neatness. It is, of course, an exaggeration to say that they require visitors to take off their boots before entering the cow stable. The inhabitants are partial to wooden shoes. Considerable sport has been made on this account. As a matter of fact, however, wooden shoes are very suitable for use in a muddy country. They not only keep the feet dry, but may be removed readily.

Holland has been called the "grocer of Europe." The merchants of this country buy and sell more goods per inhabitant than is true of any other country in the world. The Dutch are considered the greatest tobacco users in the world, the annual consumption being set at an incredible number of pounds per person. The people are also the greatest coffee drinkers in the world. The annual domestic consumption is twenty pounds per inhabitant. Holland is also the most thrifty country in the world. A gate off its hinges or a tumble-down house is unknown. There is comparatively little pauperism and crime.

RELIGION. About two-thirds of the inhabitants belong to the Reformed Church, a kind of Presbyterianism. Nearly one-third are Roman Catholics. The churches of both religions are supported at state expense. There is a complete system of state education. It is non-denominational in character, and is compulsory. There are numerous public preparatory schools. Although the country is not large, there are four universities, at Leyden, Utrecht, Groningen, and Amsterdam.

GOVERNMENT. During the seventeenth century Holland was the leading naval power of the world. It was during this period that New Amsterdam, now New York, was founded. The present government is a constitutional monarchy. Queen

Wilhelmina ascended the throne in 1890. She is given an allowance of $320,000 a year. The real government of the country rests in a congress of two houses and a cabinet of ministers. The state owns about half of the railways and many of the telegraph lines. An express system is conducted in connection with the postoffices. There are twenty-nine cities, each having a population of more than 25,000 inhabitants. Amsterdam, the metropolis, is the largest city. Rotterdam, the Hague, and Utrecht follow in the order named.

Thus the present kingdom of the Netherlands is bound up with Belgium, because for many years history grouped them together, and it was not until 1830 that their governments became separate. Because this country is so irregular, the different cities enjoy almost entire independence.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	12,582
Water area, square miles	614
Population (1920)	6,841,155
Chief Cities:	
Amsterdam	642,162
Rotterdam	510,538
The Hague	353,286
Utrecht	140,189
Groningen	89,895
Haarlem	76,858
Arnhem	70,714
Leiden	65,635
Niemeguen	64,899
Tilburg	62,808
Dordrecht	53,989
Number of provinces	11
Members of First Chamber	50
Members of Second Chamber	100
National revenue	$360,000,000
Bonded indebtedness	$55,000,000
Farm area, acres	2,500,000
Wheat, bushels	8,686,000
Barley, bushels	3,651,000
Oats, bushels	21,289,000
Rye, bushels	16,646,000
Sugar beets, short tons	314,486
Domestic Animals:	
Horses	362,011
Cattle	1,968,609
Sheep	437,075
Swine	449,829
Imports	$1,346,988,800
Exports	$699,405,200
Coal mined, tons	4,330,000
Herring catch, value	$5,000,000
Miles of canals	2,000
Miles of railway	2,377
Teachers in public schools	26,035

Netting, in the manufacture of fabrics, the process of knotting cords into regular meshes to form nets. The handicraft of netting is so ancient that it is impossible to trace its origin. Originally, it was employed to furnish nets for catching fish and animals for food. As the ornamental arts developed netting of finer material was made to serve as foundation for lace and embroidery and for various articles of dress. Hand netting is in itself a simple process readily learned. The thread is wound lengthwise upon a flat wooden needle; the meshes are formed over a round stick, called the spool or mesh pin. The form of the knot having been learned, a little practice only is needful to the acquiring of dexterity. Machines for netting have been in use since about 1778. They are used with steam power, and for ordinary work require but one attendant. The word netting is at present in use to designate a large class of open work fabrics, not all of which are produced by the knotting of the threads. In bobbinet, or Brussel's net, for instance, two systems of thread are used, and are twisted about each other, instead of knotted, to form the mesh. Mosquito netting is a woven fabric, the threads in which are far apart.

Nettle, an herb belonging to the same family as the elm, hemp, and hop vine. In the popular mind nettles are associated with their sting, but that is not their only characteristic. The fibre of several species is used for ropes, cloth, and lace. The fruit is used like hops in making beer. Nettle tubers are eaten in India like potatoes. Roots are boiled with alum to make a yellow dye. Chopped nettles are fine food for young poultry. Many minor uses of various species might be named. The sting of the nettle is due to pointed hairs. Each hair contains a reservoir of liquid which is set free when the hard point of the hair is broken off in the flesh. If a nettle be grasped firmly with a sliding motion, these hairs are pressed down sideways and cannot enter the hand. A careless caress which merely touches the tips of the hairs is most to be regretted. Cold water only revives the pain. A dock leaf, rhubarb juice, or vinegar will relieve the pain. The sting of an East Indian nettle is described as like the blister of a hot iron,

retaining its intensity for twenty-four hours and liable to return for eight days.

Neuralgia, a pain due, not to some injury to a part of the body, but to something wrong with the nerve itself. Neuralgia may affect an eye, one side of the face, an arm, or any other part of the body occupied by the branches of a particular nerve. Neuralgic pains are acute—described by such terms as shooting, stabbing, boring, burning, and jumping. These pains may be caused by cold, overwork, lack of sleep, worry, want of food, alcohol, fright, etc.

Neurasthenia, nū-răs′thē-nī′a, a term meaning literally "nerve weakness," and designating the condition known popularly as nervous prostration. Nervousness, that is undue sensitiveness to impressions from external sources, may develop into nervous prostration. It is a functional disorder with no change in nerve structure. Neurasthenia is not to be confounded with hysteria, although the one sometimes coexists with the other.

The chief causes of nervous prostration are overwork, nervous shock, worry, dissipation, and inattention to the ordinary laws of hygiene as to sleep, fresh air, and exercise. Women are subject to this affliction more than men. Extremes of climatic condition, too much coddling as children, failure to teach young people the necessity of self control, and the habit of concentrating thought upon one's self, common to the idle and the selfish, are factors often of great influence in causing neurasthenia. The most pronounced symptom is an increasing inability for either mental or physical exertion. Headache, backache, dyspeptic symptoms, irritability, insomnia, neuralgic pains, and various other discomforts may intensify the trouble.

The treatment of this "American disease," as it has been called, is based upon the system of Dr. S. Weir Mitchell, and is applied more or less strenuousıy as the individual case requires. It consists of isolation, rest, massage, and "over feeding," that is the giving of food in larger quantities than the average person requires in health.

Various forms of psychotherapy have been successful also, the calming of the patient's fears and diverting of his mind into wholesome channels of thought, being in many cases the one thing needful.

Neutrality, a friendly relation that one nation maintains with two other nations which are at war with each other. This state of non-interference with two belligerent nations is more or less a modern institution, for in ancient times, when wars were frequent, and force rather than arbitration was wholly depended on, a state of neutrality was practically an impossibility. Neutrals have their rights as well as their obligations. They are denied the privilege of lending aid to either party, but, on the other hand, their own territory is immune from hostile invasion. It is customary, at the beginning of a war, for any nation desiring to remain neutral to issue a proclamation which will state specifically the rules to be observed in its relations with the warring forces. These neutrality laws are strictly observed. Violation of them is considered criminal and furnishes sufficient ground for damages against the nation in question. The doctrine of neutrality is gradually growing to be a vital and important feature of our code of international law. Among some of the more generally accepted laws governing the obligations of a neutral nation, are:

1. Preventing the outfitting of vessels intended to carry on war with a nation with which it is at peace.

2. Preventing a belligerent from using its ports as a base of naval operations; or for renewing military supplies. The vessel of a belligerent must not remain in a neutral port more than twenty-four hours, and can obtain only so much coal and other necessities as will enable it to reach its nearest home port.

3. Using all reasonable means to prevent violation of these laws.

In protection of neutrals, it has come to be recognized in International Law that a neutral vessel carrying an enemy's goods is exempt from seizure, as are neutral goods though carried in an enemy's ships. This last of course does not apply to contraband of war.

Nevada, ne-va′da, a southwestern state of the American Union. About one-third of the entire border is formed by the state of California. The southwestern corner

borders on the Colorado River for perhaps 200 miles, separating the state from Arizona; on the north, Oregon and Idaho form the boundaries; and on the east, Utah.

THE PEOPLE. In 1920 Nevada had a population of only 77,407, the smallest among the states. No city in the state has a population exceeding 13,000, and but one, Reno, has more than 10,000 inhabitants; all of the other communities fall below the 5,000 mark. Yet in 1920 the urban population, 19.7 per cent of the total, was greater than that of seven other states whose populations were considerably larger. In point of density Nevada ranks last with 0.7 to a square mile. Carson City, the capital, has 1,685 inhabitants.

SURFACE AND DRAINAGE. The surface consists chiefly of alkali plains, mountains and river valleys. The interior rivers are short and empty into brackish lakes. The largest body of water in Nevada is Pyramid Lake, about thirty-five miles in length. Lake Tahoe lies between Nevada and California at an altitude of 6,000 feet. The general elevation of the basin is about 4,000 feet above the sea. Wheeler Peak, the loftiest mountain, rises to a height of 13,058 feet.

Many of the streams of Nevada are entitled to the name only in the wet season, for during the remainder of the year they are only dry, hard-baked depressions crossing the burnt land. The largest river is the Humboldt, which rises near the northeast corner of the state and pursues a winding course toward the southwest for 375 miles, emptying into Humboldt and Carson sinks. The Nevada "sink" is but a swampy hollow that becomes a hard, dry hole after the rainy season passes.

CLIMATE. Nevada has a mild but very dry climate, averaging about 50° F. for the year. Because the state lies in a high altitude the nights are cool even after days of intense heat. The annual rainfall is only ten inches, and snow, save in the mountain peaks, is seldom seen; long periods of drought are usual, yet this dry, mild climate is very healthful.

MINERALS. As might be expected from so mountainous a region, the chief wealth is mineral. The famous Comstock Lode, near Virginia City, yielded $306,000,000 of silver between 1859 and 1880. The Sutro Tunnel, designed to facilitate the escape of water, is the greatest mining tunnel in the world. In the production of silver, Nevada ranks third among the states. Other minerals are gold, antimony, copper, mercury, lead, coal and nickel. There are also deposits of sulphur, gypsum, zinc, salt and borax. There are unlimited quantities of building stone, granite, sandstone, agate, slate, marble and limestone awaiting a future market. Of late the mining of copper has become very important, and valuable deposits of tungsten are worked. Graphite, platinum and mineral waters of various kinds are found in small quantities.

AGRICULTURE. As is usual in a state whose rainfall averages but ten inches a year, irrigation is the prime need of the agriculturist. The United States census bulletin gives 561,447 acres as the area actually irrigated and 1,382,036 acres as the area included in Nevada enterprises in prospect in 1920. Under irrigation much of the soil proves highly productive. The principal crops are hay, wheat, barley, corn, potatoes and oats; hay is the largest crop, followed by potatoes. Nevada has 52,429,485 acres of vacant public land, about twice as much as has any other state; and until water for irrigating this is available it is likely to remain unclaimed.

MANUFACTURE. Nevada has fewer manufacturing establishments than any other state; the last industrial census gives 166 as the total number. These were capitalized at $16,834,561 and gave employment to 3,119 wage earners. Flour and lumber milling, car building and repairing, and smelting are the principal industries.

TRANSPORTATION. In 1921 Nevada had 2,296 miles of railroad, and no navigable waterways. The Southern Pacific and Western Pacific railroads cross the state in the north, and across the southern part of the state run the San Pedro, Los Angeles & Salt Lake and the Tonopah & Tidewater (now a part of the Union Pacific) railroads. Wagon trains are still largely used where transport is needed in connection with mining operations in isolated sections.

INSTITUTIONS. The Nevada charitable institutions include the Hospital for Mental Diseases at Reno, Crittenden Home for Girls at Reno, and the Orphans' Home at Carson City. The Orphans' Home educates at public schools the children in its keeping and it does not compel them to wear a uniform. The state prison is at Carson City, and at Elko is an industrial school. Juvenile male delinquents are cared for in the Nevada School of Industry, established in 1915, while the female delinquents as well as the deaf, dumb and blind are cared for at the state's expense in institutions in other states.

EDUCATION. Primary education is compulsory for all children from eight to sixteen years. In 1920 there were 378 elementary public schools and 41 public high schools. This gives Nevada, considering the population, high rank in the matter of public instruction. At the last census the total of illiterates was only 5.9 per cent, of whom but .4 of 1 per cent were native whites. A school of mines is maintained at Virginia City, and at Reno is the University of Nevada.

The University, founded in 1874, existed at first only as a preparatory school, at Elko. It was moved to Reno in 1886 and was made a state university. It is organized into colleges of arts and sciences, education, agriculture, mechanical and civil engineering and domestic science. In 1922 there were 836 students and 60 instructors.

GOVERNMENT. Nevada is governed under its original constitution, adopted at the time of its admission in 1864. A peculiar feature of the electoral system is the right of Nevada's citizens to vote even when absent from the state. The clause permitting this was adopted because many Nevada citizens were participating in the Civil War when the state was admitted.

The legislature consists of a senate of 17 members elected for four years and a house of representatives whose 37 members are elected for two years. The senate cannot have more than 75 members. The initiative and referendum are in effect.

Executive power is vested in a governor, lieutenant-governor, secretary of state, treasurer, attorney-general, comptroller, surveyor-general and inspector of mines. The governor, attorney-general and secretary of state form a state board of prison commissioners and a board of examiners.

The judiciary consists of a supreme court of one chief justice and two associate justices, nine district courts, a juvenile court and courts of justices of the peace.

All public officials are subject to recall, and a corrupt-practices act limits expenditure for political campaigns to twenty per cent of one years' salary paid to each officer. The state has enacted wise laws covering workmen's compensation, child labor and pure food and drugs.

HISTORY. It is generally believed that a white man did not cross Nevada until 1775, when a Franciscan friar, Francisco Garces, passed through on his way to California. Trading posts were established on the Humboldt River by the Hudson's Bay Company early in the eighteenth century, and in 1848 the United States acquired the territory from Mexico and made it a county of California. In 1850 a part of the state was incorporated into the newly organized Utah Territory. Residents in Carson Valley, claiming that they were not properly protected under the Utah government, in 1853 and 1856 asked to be annexed to California. A provisional government was established at Carson City in 1858.

In 1859 the Comstock Lode was discovered; miners and adventurers swarmed in; and in 1861 a new territory was organized. The state was admitted in 1864 and has since suffered several reactions owing to the exhaustion of various minerals.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	109,821
Water area, square miles	869
Forest area, acres	480,000
Irrigated area. acres	561,447
Population (1920)	77,407
White	70,699
Asiatic	1,455
Indian	4,907
Chief cities:	
Reno	12,016
Tonopah	4,144
Sparks	3,238
Carson City	1,685
Number of counties	17
Members of state senate	17
Members of house of representatives	37

Salary of governor	$7,000
Representatives in Congress	3
Assessed valuation of property	$214,000,000
Bonded indebtedness	$1,669,000
Farm area, acres	2,357,163
Improved land, acres	594,741
Potatoes, bushels	592,000
Wheat, bushels	493,000
Barley, bushels	187,000
Corn, bushels	29,000
Hay, tons	356,000
Wool clip, pounds	9,000,000
Domestic Animals:	
Horses	74,000
Milk cows	32,000
Other cattle	540,000
Sheep	1,532,000
Swine	30,000
Manufacturing establishments	166
Capital invested	$16,834,561
Operatives	3,119
Raw material used	$16,490,617
Output of manufactures	$22,874,311
Gold, value	$3,340,000
Silver, ounces	6,681,000
Copper, pounds	15,515,000
Lead, pounds	7,803,000
Zinc, pounds	10,698,040
Miles of railway	2,296
Teachers in public schools	805
Pupils enrolled	14,774

New Albany, Ind., an industrial city and the county seat of Floyd County, is on the Ohio River opposite Louisville, Ky., and is served by several railroads. It is two miles below the falls of the Ohio, and splendid water power is furnished to industrial establishments producing engines and boilers, furniture, flour, rolling mill products, lumber and leather. There are also foundries and pork packing establishments.

New Albany contains St. Mary's Academy, Holy Trinity Academy, good public and parish schools and a public library. The population was 22,992 in 1920.

Newark, the metropolis of New Jersey, is also the county seat of Essex County and a port of entry. It is situated on Newark Bay near the mouth of the Passaic River and about ten miles west of the Hudson River and New York City. It is served by the Delaware, Lackawanna & Western, Central of New Jersey, Erie, Lehigh Valley and Pennsylvania railroads, and has surface and subway (called "The Tubes") connection with New York City.

The city is built on a strip of land that is level for a mile or more inward from the water front and that then rises gradually to the Orange Mountains, the foothills of the Appalachian System. Near to and physically connected with Newark are numerous suburbs—Irvington, Belleville, Bloomfield, Orange (proper), East, West and South Orange, Glen Ridge and Montclair,—and across the Passaic are Kearny, East Newark and Harrison. Bridges, trolleys and steam roads link these with Greater Newark.

Parks, Buildings and Institutions. The parked area of Newark is approximately 600 acres, and almost all of the parks in the system are linked together by boulevards and shaded drives.

The noteworthy buildings of such a large and prosperous city are too many for enumeration. The home offices of several great insurance companies are worthy of special attention, as are the Roman Catholic Cathedral, the Federal building, city hall, county court house, public library (one of the finest in America), and many of the elementary and high school buildings. The theaters and hospitals of Newark are among the most modern in the United States. The city has a number of private and special schools, Newark Academy and several Roman Catholic educational institutions. The New Jersey Historical Society has excellent collections of material housed in a building of its own.

Industry and Commerce. Newark is primarily a manufacturing city, frequently referred to as the "Birmingham of America." Of all the industries, copper-smelting, the making of leather and leather products, and jewelry are, judged by the value of the products, first in importance. The first shoemaker to settle in Newark came in 1680, and he was followed in the course of time by others. In 1676 or earlier the first tan yard was established. The hides tanned were for the use of the townspeople, who preserved them carefully until the annual visit of the shoemakers to the respective families, when they were made into shoes for the whole family. The tanning of hides and the making of shoes and other leather products were the first industries of Newark, but they were almost entirely for home consumption until about

1790. Then they developed into a profitable industry, and shipped the products to outside points. Hats were manufactured in Newark in 1800 and probably earlier; the jewelry industry began in 1801.

The first patent leather manufactured in the United States was made in Newark by Seth Boyden in 1818. In 1826, while the rest of the townspeople were celebrating the Fourth of July, Boyden discovered the process of making malleable iron. He also contributed so much to Newark's early industrial expansion that the city has honored him with a beautiful monument, located in one of the city parks.

Newark is one of the important meat packing cities of the East, and it has factories for the production of jewelry, cut glass, cutlery, thread, chemicals, paints and varnishes, machine shop and foundry products, electrical machinery and appliances, celluloid, brass and copper ware and innumerable other articles.

The commercial importance of Newark is constantly increasing. The city has spent millions of dollars for the improvement of highways, docks, warehouses and the other facilities that have served to make this thriving community one of the principal ocean-rail transfer points for a great extent of territory.

History. In 1666 a little band of Puritans from Milford, Connecticut, founded the present Newark but called it also Milford, or New Milford. The name was changed a year later to Newark, after Newark-on-Trent, the city in England from which many of the settlers had come, including their beloved parson, Abraham Pierson. It was the last of all the Puritan settlements made in the United States. The first body of selectmen was elected in 1669. According to the old town meeting minutes, it was in 1713 that, for the first time, money was voted to establish a permanent town government. The government by town meeting was continued until well into the nineteenth century. Washington made his headquarters in Newark during a short period in his retreat across the state in the fall of 1776. Newark was chartered as a city in 1836. In 1920 the population was 414,524. Only 113,413 of these are native whites of native parentage. The remainder are either foreign born or of foreign parentage, or Negroes. People from nearly all parts of the globe are represented in Newark's cosmopolitan population.

Newark, Ohio, a manufacturing city and the county seat of Licking County, is on the junction of three branches of the Licking River, on the Ohio Canal, and on several railroads. In the near-by hills are deposits of coal and sandstone, and a good supply of natural gas. Also near the city are two large earthworks, testimonials to the peculiar industry of the Mound Builders. The city's more important manufactures are glass ware, golf sticks, electric cars, bottles, rope, flour, lumber, chemical apparatus, stoves and shoes. Extensive locomotive works are maintained here by the Baltimore & Ohio Railroad.

Newark contains a children's home, fine public schools, a public library, and a summer resort called Moundbuilders Park. The population was 26,718 in 1920.

New Bedford, a manufacturing town of Massachusetts on an arm of Buzzard's Bay. Until about fifty years ago New Bedford was noted chiefly as a center for whale fishing, but as that industry declined manufacturing increased in importance. In the manufacture of fine cotton goods and cotton yarns New Bedford ranks first among the cities of the United States. Other leading manufactures are shoes, woolens, glass, paint, and cordage. It has regular steamship connection with Martha's Vineyard, Nantucket, and New York City; electric lines run to Fall River, Brockton, and Dartmouth. The harbor is very beautiful; it is spanned by a handsome bridge connecting New Bedford with Fairhaven. The city has a good park system and many fine public buildings. Located there are a Roman Catholic kindergarten and ten parish schools of that church, the Swain Free School of Design and a State Textile School. The population in 1920 was 121,217.

New Brunswick, the largest of the Maritime Provinces of Canada. Its area is 27,985 square miles, about 6,500 square miles larger than Nova Scotia, and about

the same as the combined areas of Vermont, New Hampshire and Massachusetts. On the south and east, except for the narrow tongue of land called the Isthmus of Chignecto, connecting the Nova Scotia peninsula with the mainland, New Brunswick has water boundaries, the Bay of Fundy on the south and the Gulf of St. Lawrence on the east. On the north is Quebec, and on the west are two rivers, the St. John and the St. Croix, forming a part of the international boundary. In fact the most noteworthy physical feature of the province is its network of rivers, lakes and bays, which make it possible to reach almost any point in its boundaries by water. The headwaters of the large rivers—the St. John, Miramichi and Restigouche —are separated only by short portages, once traversed by the trappers and the Indians, now by the sportsmen. The upper courses of all the rivers are used in lumbering, but only the lower courses are important in navigation. The province is divided into two parts by a low ridge or height of land extending from southwest to northeast. The highest point in the province is Mt. Carleton, 2,630 feet.

Population. The census of 1921 gave New Brunswick a total population of 387,876, as compared with 351,889 in 1911. This was a larger increase in ten years than had previously been shown in thirty years. The trend of population to the cities, though not yet so strongly marked as in some other parts of Canada, is indicated by the decrease in the percentage of rural population from 76 per cent in 1901 to 72.85 per cent in 1911 and to 68.5 per cent in 1921. About two-thirds of the people are of British descent, while a little less than one-third are of French. Immigration, except in small numbers from Great Britain and the United States, has practically ceased.

Agriculture. Farming has always been the leading industry, as the percentage of rural population would indicate. The most fertile areas are the alluvial lands in the river valleys, where hardy fruits, especially apples, are raised. The uplands, too, are fertile for the most part, and yield good crops of hay, oats, buckwheat, turnips and potatoes. Berries and small fruits are abundant, and are shipped to New England markets late in the season. The raising of live stock, particularly sheep and dairy cattle, is increasing in importance. The newest branch of agriculture is fur farming, which has generally been profitable to those engaged in it but can not be said to have reached a stable basis. The breeding of foxes and other fur-bearing animals is, however, admittedly profitable and practicable.

Lumbering, Fishing and Mining. The lumberman and forest fires have destroyed about one-third of New Brunswick's forests, but the lumber industry is still second only to agriculture. In the province are hardwoods, including birch, beech, maple, ash, firs and spruce. A river without a lumber mill is unknown in New Brunswick.

Third on the list of great industries are the commercial fisheries. The leading varieties of fish caught are herring, sardines, cod, haddock, hake, salmon, lobsters and oysters. Some trout, salmon and shad are taken from rivers and lakes for commercial purposes, but over 95 per cent of the catch comes from the sea fisheries. Sardines and herring together comprise nearly one-half of the total value.

New Brunswick is not as rich in minerals as its neighbor Nova Scotia. Coal is known to underlie about one-third of the province, but the only areas commercially important are those near Moncton and Fredericton. For the most part the seams are impure or thin. Iron, nickel, manganese, antimony and salt are found in varying quantities. Gypsum and various building stones are abundant. Natural gas was discovered near Moncton in 1911, and this field is one of the three largest in Canada.

Government and Education. The government is like that of the other provinces of the Dominion. The nominal head of the executive branch, the lieutenant governor, appoints the premier and the premier selects his executive council. As in all the provinces the ministry is responsible to the legislative assembly, and holds office only as long as it commands the confidence of a majority of the members. The

assembly, consisting of 48 members, is elected for five years, but may be dissolved sooner by the lieutenant governor. There was formerly also a second chamber, the legislative council, whose members were appointed for life, but this was abolished in 1892. Unlike other provinces, New Brunswick has yet no well-developed system of municipal government. Cities may be incorporated by act of the assembly, but local government is carried on through the county councils, consisting of two councillors elected for a two-year term by each parish. There are local police magistrates and county judges with limited jurisdiction, but the provincial supreme court is the only judicial body with unrestricted original jurisdiction. The chief justice and two puisne judges sitting together constitute a court of appeals.

All public schools are free and non-denominational. The schools are under the general control of a provincial board of education, comprising the lieutenant governor, the members of the ministry, the chancellor of the University of New Brunswick, and the chief superintendent of education. The provincial normal school and the university are both at Fredericton. There are also a number of denominational institutions, of which Mount Allison University (Methodist) at Sackville, and the University of St. Joseph (Roman Catholic) at Memramcook are the largest.

HISTORY. Previously to 1784 New Brunswick has no separate history because it was a part of Acadia or Nova Scotia. The first British settlement in the present provincial limits was made on the Miramichi River in 1762, but as late as 1782 there were less than 1,000 settlers in the region. The province was really founded in 1783, when some five thousand United Empire Loyalists left their homes in the United States and settled in Nova Scotia. In the next year, 1784, New Brunswick was erected into a separate province.

The new province flourished economically, but for half a century suffered politically from irresponsible government. In the long struggle to remedy this condition the popular leader was Lemuel Allan Wilmot. Under his guidance responsible government was finally established in 1848. Wilmot subsequently worked hard for Confederation, and became the first lieutenant governor of the province in 1867. Another great leader in the Confederation movement was Sir Samuel Leonard Tilley, who became the first provincial premier.

Soon after Confederation the movement for the abolition of the Roman Catholic separate schools gained headway, and was successful in 1871. In 1875 a compromise was effected, however, permitting instruction of Roman Catholic children in the public schools by teachers of their own faith under certain specified conditions. Local questions have played the chief part in provincial politics, although occasionally an election has turned on national issues. A noteworthy change was the creation of a public utilities commission in 1910, the same year in which occurred the disastrous fire at Campbellton. New Brunswick has had local option for counties on the liquor question, but the voters in 1921 overwhelmingly defeated a proposal to permit the importation of liquor for personal use. By an act of 1919 the sale of liquors at wholesale is controlled by the lieutenant governor, who appoints a board of three members to administer the details; the board alone may sell liquors to doctors, dentists or retail licensees.

STATISTICS, from the latest official sources:

Area, square miles	27,985
Population (1921)	387,876
St. John	47,166
Moncton	17,488
Fredericton (capital)	8,114
Campbellton	5,570
Chief crops (bushels)	
Oats	6,000,000
Buckwheat	1,250,000
Potatoes	7,000,000
Turnips, etc.	2,500,000
Hay and clover, tons	1,000,000
Fisheries annual catch	$5,000,000
Mineral production	$11,500,000
Lumber and lumber products	$15,000,000
All manufactures	$50,000,000
Miles of railway	2,000
Dominion senators	10
Members Dominion House of Commons	11
Members provincial assembly	48

New Brunswick, N. J., an industrial city and the county seat of Middlesex

County, is situated at the head of navigation on the Raritan River, 31 miles southwest of New York City. New Brunswick is the eastern terminus of the Delaware & Raritan Canal, and is served by the Pennsylvania and the Raritan River railroads, and by interurban electric lines.

This city has extensive manufacturing interests, its plants producing boots and shoes, surgical and medical supplies, chemicals, boilers, automobiles, lineoleums, wall paper, strings for musical instruments, hosiery and rubber goods. The principal articles of commerce are coal, cotton and raw material for general manufacture.

New Brunswick is the seat of Rutgers College, the New Jersey College for Women, the State Agricultural and Mechanical College and a theological seminary. The city has modern primary and high schools, three libraries, a Federal building and a parked area of about 250 acres. One of the most notable structures here is the magnificent stone bridge that spans the Raritan River. In 1920 New Brunswick had 32,779 inhabitants.

Newburgh, N. Y., is situated on the Hudson River, 5 miles above the Highlands of the Hudson and 58 miles north of New York. It was founded in 1709 by Germans from the Rhenish Palatinate, who named it Palatine Parish by Quassaic. Later, the English and Scotch emigrants changed the name to Parish of Newburgh. Newburgh was the headquarters of the American Army from March 1782 until near the close of 1783. It was here that Washington received the Nicola letter proposing that he become king. The American army was formally disbanded here in 1783. A Tower of Victory, erected by the state and the Federal governments, commemorates the event.

Newburgh is of industrial importance, manufacturing plaster, felt hats, paper, woolen and cotton goods, powder, perfume, leatherette, silk, tools, steam boilers, and many other articles. It also enjoys some popularity as a summer resort. It has good schools, and contains the first free public library in the state. Population in 1920, 30,366.

Newcastle, the chief city of Northumberland, England. It is situated near the mouth of the Tyne which is crossed here by numerous bridges. The site was well known to the Romans, being the eastern terminus of Hadrian's Wall. A Norman castle built in 1080 was long a noted stronghold. During the border warfare between England and Scotland, Newcastle was taken and retaken repeatedly. There are important manufactures of hardware, glass, chemicals, cannon, locomotives, and machinery. Numerous steamship lines ply from Newcastle to London, Leith, and various ports of continental Europe. It is the largest exporting coal market in the world, whence the phrase, "To carry coals to Newcastle," expressive of uselessness.

New Castle, Pa., a manufacturing city and the county seat of Lawrence County, is situated at the confluence of the Shenango and Neshannock rivers, 50 miles northwest of Pittsburgh. The city has interurban electric service to nearby points, and steam road transportation is afforded by the Buffalo, Rochester & Pittsburgh, Erie, Pennsylvania, Baltimore & Ohio and Pittsburgh & Lake Erie railroads.

Surrounding New Castle is a fertile agricultural region in which there are also good deposits of bituminous coal, iron ore, limestone, fire clay and sandstone. The city's factories produce boilers, heavy and light machinery, paints, pottery, bricks, files, sheet steel, tin plate and terneplate, cement, stoves, plows, radiators and hosiery.

New Castle has a Federal building, a Y. M. C. A., Y. W. C. A., Shenango Valley and New Castle hospitals, high schools, a library, Almira Home for Aged Ladies and a handsome court house and post office. The city was founded in 1812 and was chartered in 1869. In 1920 the population was 44,938.

Newcomb, Simon (1835-1909), an American astronomer. He was born at Wallace, Nova Scotia, but when eighteen came to Maryland. In 1858 he was graduated from the Lawrence Scientific School of Harvard. Three years later he was made professor of mathematics in the navy, and was sent in that capacity to the Naval Observatory at Washington. There he supervised the building of a huge telescope.

For twenty years after 1877 he was senior professor of mathematics, and superintendent of the Nautical Almanac office, also serving from 1884 to 1893 as professor in Johns Hopkins University and editor of the *American Journal of Mathematics*. At the end of this time he retired, and spent the rest of his life in the interest of science. His position as head of the Nautical Almanac office was one of great importance, the American Ephemerus or Nautical Almanac being the standard authority for the location of celestial bodies, used by all astronomers and by ship captains everywhere.

Newcomes, The: Memoirs of a Most Respectable Family, a novel by William Makepeace Thackeray. It was published in installments from October, 1853, to August, 1855, and was then put out immediately in book form. It ranks with *Pendennis* and *Vanity Fair* as among Thackeray's best works. The scene is laid in England in the first half of the nineteenth century. Many people are introduced who figure in the previous novels, especially in *Pendennis* and *Vanity Fair;* but the principal characters are new. Colonel Newcome is the most striking character in the story and is one of Thackeray's most memorable creations. It has been said that he is the most "perfect type of the simple English gentleman to be found in literature." This grizzled old soldier loses his fortune and is supported by the charity of the brotherhood of the Grey Friars.

If Thackeray had written nothing else, his picturing of the exquisite simplicity and self-respecting dignity with which Colonel Newcome accepts the only life that is open to him, would have been enough to prove his genius.—E. M. Tappan.

New England Confederation, a colonial union of Massachusetts, Plymouth, Connecticut, and New Haven. It was formed in 1643 and lasted over forty years. The confederation is in many ways suggestive of our present federal union of states. The precautions, compromises, and outcroppings of human nature show that the root of the matter was in these old colonists. The official name was "The United Colonies of New England." Articles of confederation were drawn with pious care. The little colonies insisted on the same representation as the large one. The little congress was composed of eight members, two from each colony; for Plymouth did not propose that Massachusetts Bay should spread wide skirts over her at the council chamber. Any six of the eight commissioners could bind the colonies. Once, in 1653, Massachusetts, having a greater population than the other three combined, refused flatly to be bound by an obnoxious act of the commission. Here we have nullification and threatened secession, rebellion and treason, all in the same teapot; but the commissioners, "being all in church fellowship with us," got together somehow. The dignity of Massachusetts was appeased, the union was preserved, and peace and concord were restored.

Among other provisions of the articles of confederation was a clause providing for the return of fugitive servants. This appears to be the germ of later fugitive slave laws and the basis of American extradition. The commissioners stood stoutly against the aggression of the Dutch from the direction of the Hudson Valley, and negotiated a boundary which neither might overstep. Correspondence was carried on with the French governor of Acadia and, more than once, a united front was presented to the Narragansett Indians.

New England Primer, a famous first reader at one time popular in the colonies. It was compiled by Benjamin Harris, who, about 1690, abridged the *New England Primer* from an early work known as the *Protestant Tutor.* The *Primer* was bound originally in thin sheets of wood covered with paper. It was embellished with cuts and purported to be an easy and pleasant guide to the art of reading. It opened with a woodcut of "Good Boys at their Books," and an announcement that:

> He who ne'er learns his A, B, C,
> Forever will a Blockhead be.

Then follow the capitals and the small letters. They are followed by easy syllables for children, as ab, eb, ib, and ba, be, bi; readily recognized as the forerunners of the old *Webster Spelling Book.* A few word lists of one, two, three, four, five, and six syllables respectively precede the Lord's Prayer and the Apostles' Creed. A few pages are occupied with pictures, one for each letter, an apple for A, a cat for C, an

owl for O, a squirrel for S, a whale for W, etc. Moral announcements are not lacking such as:

In Adams fall
We sinned all.

The idle fool
Is whipped at school.

Time cuts down all,
Both great and small.

Whales in the sea,
God's voice obey.

There are in all about three score small wood cuts with appropriate remarks and mottoes. Very crude the cuts seem now. A score or two of Scriptural quotations, Dr. Watts' *Cradle Hymn,* beginning, "Hush my dear, lie still and slumber," "Now I lay Me," and the *Shorter Westminster Catechism,* are included in the contents. It is estimated that no less than 2,000,000 copies of the *Primer* were sold in the eighteenth century. Possibly fifty copies are extant, representing forty editions.

New Forest, a public pleasure ground on the English channel, twenty minutes southwest of Southampton. It has an area of about 144 square miles. It was laid out in 1079 by William the Conqueror as a game preserve. He destroyed a number of hamlets and drove out many poor inhabitants. Peasants caught hunting in the forest were fortunate if they got off with mere scourging or loss of their ears. Two of the Conqueror's sons, William Rufus and Richard, were killed accidentally while hunting in the forest. The people regarded their death as a providential punishment for his cruelty. The old oak and beech forest has largely disappeared. Deer have not been kept since 1851.

Newfoundland, a British colony of North America, is an island lying across the entrance to the Gulf of St. Lawrence. Labrador is a dependence of Newfoundland. Newfoundland is separated from the most easterly point of Labrador by a strip of water ten miles wide known as the Strait of Belle Isle. Southwest, 65 miles distant, is Cape Breton Island, separated from Newfoundland by Cabot Strait. Newfoundland is the closest point to Europe in North America; from Valentia to Ireland the distance is but 1,640 miles.

Physical Feature. The island is roughly triangular in shape, and is very rugged, especially in the southwest; here the coast range attains a height of almost 2,000 feet. The greatest height is reached within a few miles of the coast; the coast itself is generally steep, rugged and barren and is indented with numerous deep inlets. Inland the surface becomes less rugged, spreading out into undulating stretches of land, some barren and some marshy, so that but few of Newfoundland's 42,734 square miles are cultivable. The Gander, Exploits and Humber are the principal rivers. The Exploits rises in the southwestern corner of the island and flows northeastward to the Atlantic Ocean by way of a chain of lakes. The most disagreeable climate in the island occurs in the northeast, where the Arctic Current touches the coast, making it cold and unusually foggy.

The People. The bulk of the Newfoundland population is of Scotch, English and French stock, and the manners and customs to be met with on the island are very similar to those of the fishing and agricultural districts of the home lands. At the last census the inhabitants numbered 263,683. By far the greater part of these are engaged in the fishing industry. The people are almost all adherents of the Roman Catholic or the Anglican church, with Catholics slightly in the majority. The schools, numbering about 1,200 are all denominational, and are under the control of four superintendents, one each for the Roman Catholics, Anglicans, Methodists and the Salvation Army. There are four colleges, maintained by Catholics, Anglicans, Presbyterians and Methodists. The capital and largest city is St. Johns, which has about 35,000 inhabitants. Other towns are Bonavista, 3,911; Carbonear, 3,540; Twillingate, 3,348.

Industry and Commerce. In the order named, fishing, lumbering and mining are the principal Newfoundland industries. The coasts swarm with fish, especially cod, and fish and fish products annually constitute about 80 per cent of Newfoundland's exports. Great quantities of herring, salmon and lobsters are taken, and the whale and seal hunting industries are very im-

portant. In 1921 the seal catch numbered 101,452.

About 15,000 square miles of the colony are forested, and as spruce is the predominant tree, the preparation of timber for the manufacture of pulp and paper is an important branch of the lumbering industry. In 1920, 80,719 tons of paper were exported, and also 19,864 tons of pulp. The production of these is steadily increasing. Pine and fir also grow in valuable quantities.

It is estimated that 5,000,000 acres of land are arable, but only a small amount of this is under cultivation. Potatoes, turnips, hay and oats are the principal crops, and along the river valleys the production of these is easy and profitable. Horses, cattle and sheep are raised and their numbers are steadily increasing.

The mineral resources of the island are considerable, and of late years iron ore has constituted the bulk of the mineral product, though copper, coal and petroleum deposits are worked. Lead, silver, gypsum, marble and granite occur, but no really valuable deposits have been discovered.

Transportation and Communication. At the last industrial census there were about 1,000 miles of railroad, all but a few miles of which were owned by the government. The island is girdled with telegraph lines; the telegraph system is operated as a public utility under government control. There are several powerful wireless stations in Newfoundland and along the Labrador coast, and more are in prospect. The telephone lines of the island measure about 1,100 miles.

Government. Executive power is vested in a governor, appointed by the British sovereign. He is assisted by an executive council of not more than 9 members; a legislative council of not more than 24 members; and an elected assembly of 36 representatives. The colony is divided into 18 electoral districts.

History. Newfoundland was discovered by John Cabot in 1497, but it was not until Spanish, Portuguese and French fishermen proved that the value of the cod fisheries that the island was formally annexed by Great Britain, 1583. The British attempts to colonize were successively frustrated by the French; but by the Treaty of Utrecht, 1713, France recognized England's claim to the island, but reserved the right to the west coast cod fisheries. This was not given up until 1904. Development was slow until the establishment of representative government, 1832. In 1905 the United States and Great Britain engaged in a controversy over the cod fisheries, but this was settled by The Hague Tribunal in 1910. See Labrador; Grand Banks.

Newfoundland Dog, one of the most intelligent, gentle, handsome and valuable of the canine family, has a puzzling origin, for it is not a Newfoundland aboriginal, though it was first introduced to the United States and Europe from that island. It is probably a cross bred animal, but the original breeds are not known; it seems, however, that the Newfoundland has a large amount of pointer blood in its veins.

It is a massive, beautiful dog, usually standing 27 inches high and sometimes weighing 100 pounds. Its coat is very heavy, coarse and oily, resisting cold and water, and is usually black and white or all black, though brown and white is a not uncommon combination. The fore legs are straight, the chest is deep and the shoulder heavy. Unusual freedom of leg action and great strength combine to make the Newfoundland a good traveler and strong swimmer; the broad, partially webbed feet also contribute to his swimming ability. The head is broad and massive, the eyes small, deep-set and intelligent; the ears are small and lie close to the head.

This dog was introduced to Europe at the end of the eighteenth century, and he won such high esteem for his intelligence, beauty, keen scent and deftness in retrieving that he was exported until he became almost unknown in his native habitat, where he is still scarce. But in the United States and Great Britain the breed has been continued from the original stock.

Newgate, a prison of London, thought to have been built as early as the twelfth century, and referred to as a prison in 1207. It received its name because of its location at the end of Newgate Street, at the new gate of the city. It was destroyed several

times, and repeatedly rebuilt. Through the efforts of Mrs. Fry and others, in 1808, the miserable conditions which had prevailed in the prison for centuries were vastly improved, and gradually the place assumed a respectable air. Many men of eminence have been imprisoned within its walls, and the prison has always attracted attention because of its historic interest. The building was entirely destroyed in 1902.

New Glasgow, an industrial town of Nova Scotia, is about nine miles south of Northumberland Strait and 104 miles northeast of Halifax, on the East River and on the Intercolonial Railroad. The town is in the center of a region of productive and very valuable coal mines, and the manufacturing plants produce steel and wooden freight cars, mining machinery, castings and forgings, wooden ships, tools, bricks, agricultural implements, finished lumber, sewer pipe, gas engines, mattresses and steel and wire fencing. Spruce, hardwood, iron and limestone are found in the vicinity. New Glasgow has modern schools, good hotels and a large hospital. In 1921 the population was 8,974.

New Guinea, nū-gĭn′ē, or **Papua,** a large island in the southern Pacific. Its area is over 300,000 square miles, making it next to Australia in size among the islands of the world. It lies to the north of Australia. The interior rises to a height of 20,000 feet. In 1885 the northeastern portion was assigned to Germany, the western to the Netherlands, and the southeastern to Great Britain. British New Guinea is annexed to Australia for governmental purposes. The Treaty of 1919 gave German Guinea to Britain. Firearms, gunpowder, and intoxicating spirits may not be sold to the natives, who are still in the stone age of savagery. Their arms and utensils are the crudest known, and the social ideas of the natives are low. The total population is reckoned at half a million. The animals, too, are not highly developed. A wild pig, some mice and pouched animals, like the kangaroo, and animals of the duckbill order complete the list of mammals. The birds are peculiar. Parrots, pigeons, kingfishers, bower birds, and the showy birds of paradise abound. The vegetation is that of rainy, semi-torrid regions. Gigantic camphor trees and palms are conspicuous. The natives cultivate yams, rice, and sugar-cane, and collect bananas, sago, and cocoanuts. Shell pearl is exported by British Guinea. The island has boundless natural resources and will some day be a source of wealth.

New Hampshire, "The Granite State," a commonwealth of the United States and a member of the New England group, lying between Maine on the east and the Connecticut River on the west, which separates it from Vermont. Quebec borders it on the north and Massachusetts on the south. The southeastern portion borders on the Atlantic, giving the state eighteen miles of seacoast. The general shape of the state is that of a right triangle, with the slanting side on the west, and the lower righthand corner of the triangle cut off by Massachusetts. The area is 9,343 square miles, making it the third in size among the New England states.

SURFACE AND DRAINAGE. The White Mountains, occupying 14,000 square miles in the north central part of the state, constitute its most striking physical feature. The mountains are a part of the Appalachian system and contain the highest land in New England. Mount Washington, 6,293 feet, is the second highest peak in the Appalachian system, the first being Mount Mitchell in North Carolina. These mountains are separated by the valley of the Saco into two ranges known as the Presidential and Franconia. The Presidential contains five peaks over 5,000 feet in altitude. (For a description see WHITE MOUNTAINS.) To the north of these mountains the country is rolling and hilly with here and there a peak approximately 4,000 feet high and to the south are a number of isolated peaks which, because of their peculiar position, form a striking feature in the landscape. The most noted of these are Moosilauke, Monadnock, Sunappee and Kearsarge.

The Connecticut River drains the western part of the state into Long Island Sound, and the Merrimac and Piscataqua drain the southeastern section. The Saco and the Androscoggin wend their way east-

ward and reach the ocean on the coast of Maine. The Piscataqua has a broad estuary noted for its large quantities of excellent fish, and forming a good harbor. All the rivers are swift and afford abundant water power. There are numerous beautiful lakes distributed over the state, the largest and most noted being Lake Winnepesaukee, sixteen miles long and six miles wide and beautified by 264 islands. The lake is inclosed by hills and mountains and is one of the finest gems of mountain scenery in the United States. Near this lake are Squam, New Found, Winnisquam and Ossipee lakes. Connecticut Lake and Diamond Pond in the north and Echo Lake in the Franconia Mountains are all noted for their beauty.

CLIMATE. Throughout the state the winters are severe and in the northern part the snowfall is usually heavy. The southern section of the state is somewhat warmer and has an average winter temperature of 21°. The summers are cool and pleasant, making the entire state attractive to residents of Boston, New York and other large cities to the south. The annual rainfall averages 45 inches and is quite evently distributed throughout the year.

MINERALS. Granite and mica are the chief mineral productions of the state. New Hampshire ranks fifth in the production of granite and second in the production of mica. The chief quarries are in Hillsboro, Merrimack, Cheshire and Carroll counties. Whetstones, slate and limestone are quarried in paying quantities.

FORESTS. About one-third of the state is covered with forests. The White Mountain National Forest extends over the greater part of Coos, Carroll and Grafton counties, N. H. and Oxford County, Me. This forest has an area of 433,179 acres. The foot hills at the base of the White Mountains are all heavily timbered and the greater part of the state north of these mountains is also forested. Besides the national forests there are state reservations consisting of widely scattered areas totaling 12,000 acres. These woodlands are carefully protected by a state forest commission. The red spruce is the most important lumber tree and is extensively used in the manufacture of wood pulp. Some white pine still exists, and the sugar maple, birch, oak and other hardwood trees are liberally distributed throughout forest areas.

AGRICULTURE. The bottom lands or meadows along the rivers contain a deep fertile soil but in the higher altitudes the soil is usually stony and poor. Agriculture is a less important industry than manufacturing in New Hampshire. Hay and forage constitute the most valuable crops. Potatoes and Indian corn follow in the order named. Apples and strawberries are raised in large quantities and most of the farms are devoted to dairying or to the production of vegetables for city markets. Many of the mountain farms have been abandoned and sold for summer residences.

MANUFACTURES. New Hampshire ranks third among the New England states in its manufactures. The census of 1920 gave the following data concerning those industries that are organized under the factory system:

Number of establishments	1,499
Persons engaged	90.000
Primary horse power	311,722
Capital invested	$329,166,870
Material used	$239,527,617
Value of products	$407,204,934

The ten leading industries in the order of the value of their production are boots and shoes, cotton goods, paper and pulp, lumber and timber products, woolen and worsted goods, factory and machine shop products, hosiery and knitted goods, flour and grist mill products, tobacco and cigars. The largest manufacturing establishments are in the southern part of the state, chiefly on the Merrimac River, which is considered one of the greatest power yielding streams in the world and is said to turn more cotton spindles than any other river. Nashua and Manchester are the largest manufacturing centers.

TRANSPORTATION. Railways traverse the valleys in all directions and nearly every town of any importance is either on a railway or has ready access to it. The total railway mileage is 1,253 and is chiefly under the control of the Boston & Maine system. The Maine Central and the Grand Trunk have short lines within the state. The first cog wheel railway in

the world was constructed up Mount Washington and rises 3,625 feet in two and three-quarters miles. Between 1910 and 1920 over 1,000 miles of road were constructed by the state.

POPULATION. The population of New Hampshire in 1920 was 443,083, a gain of 12,511 or 2.9 per cent during the decade. The urban population in 1920 was 63.1 per cent of the whole as against 59.2 per cent in 1910. There were eight cities having more than 10,000 inhabitants.

EDUCATION. The public school system is administered by towns with the exception of a few special districts in the larger cities. The entire system is under the direction of a state board of education of five members which has the power formerly delegated to the superintendent of public instruction. This board appoints a commissioner of education and deputy commissioners who hold office until they resign or are removed for cause. The educational fund is raised chiefly by local taxation and is supplemented to some extent by state appropriations, but New Hampshire never had a grant of public lands, which could be used for school purposes. Dartmouth College (which see) is the leading educational institution, but it has no organic connection with the public school system. The State College of Agriculture and Mechanic arts is at Durham and normal schools are maintained at Plymouth and Keene. Saint Anslem's College at Manchester is the leading Roman Catholic school and Philips Exeter Academy at Exeter, and St. Paul School at Concord have a wide reputation as schools for boys.

INSTITUTIONS. The school for feebleminded is at Laconia and the soldiers' home at Tilton; an industrial school is at Manchester and a state sanitarium at Benton. The state penitentiary and a hospital for the insane are located at Concord.

GOVERNMENT. The present constitution was adopted in 1877 and is the fourth under which the state has been governed. A convention for its revision may be called every seven years if voted for by two-thirds of the voters.

The legislative power is vested in a general court which consists of a senate of 24 members and a house of representatives apportioned according to the population. Towns having over 600 inhabitants are entitled to one representative for a full term and one for every additional 1,200 inhabitants. Districts having less than 600 inhabitants are entitled to a representative for proportional part of the term.

The executive department consists of a governor and an advisory council of five members, all elected by the people for two years. The secretary of state and treasurer are elected by the general court.

The judicial department consists of a supreme court and a superior court, each having a chief justice and four associate judges. These courts are supplemented by probate courts and local courts of justices of the peace. Excepting the justices of the peace, who are appointed for five years, all judges are appointed by the governor for an indefinite period.

HISTORY. The first settlements within New Hampshire were made by fishermen from Massachusetts in the neighborhood of Portsmouth and Dover. New Hampshire was granted to George Mason but his claims were afterward withdrawn and the colony joined Massachusetts, with which it remained united until 1741. The colony took a leading part in the Revolutionary War and furnished more than its quota of soldiers for the Continental army. New Hampshire was among the first states to adopt a constitution and its ratification of the Federal Constitution assured the final adoption of that instrument. During the Civil War the sentiment of the state was strongly against slavery and it furnished a large number of men for the Union army. During the World War, New Hampshire sent 22,000 persons to the service of the government, about one-third of these were called under the selective service; the remainder volunteered. Over 72 million dollars, or about $164 for every person in the state, were subscribed to the Liberty Loans.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	9,031
Water area, square miles	310
Forest area, acres	4,000,000
Population (1920)	443,083
White	442,331

Negro	621
Foreign born	91,233
Chief cities:	
Manchester	78,384
Nashua	28,379
Concord	22,157
Berlin	16,014
Portsmouth	13,569
Dover	13,029
Number of counties	10
Members of state senate	24
Members of house of representatives	419
Salary of governor	$3,000
Representatives in Congress	4
Assessed valuation of property	$541,154,014
Bonded indebtedness	$2,314,306
Farm area, acres	2,603,806
Improved land, acres	702,902
Hay, tons	428,000
Potatoes, bushels	2,240,000
Corn, bushels	1,325,000
Oats, bushels	630,000
Butter, pounds	3,240,368
Eggs, dozens	7,499,470
Wool, pounds	204,000
Domestic Animals:	
Horses	39,000
Milk cows	101,000
Other cattle	70,000
Sheep	31,000
Swine	57,000
Manufacturing establishments	1,499
Capital invested	$329,166,870
Operatives	83,074
Raw material used	$239,527,617
Output of manufactures	$407,204,934
Output of granite	$2,131,000
Output of mica	$120,000
Forest products, value	$5,532,115
Miles of railway	1,253
Teachers in public schools	2,926
Pupils enrolled	74,739

New Haven, the most populous city of Connecticut, is situated on a level, sandy tract between two small rivers at the head of New Haven Bay, four miles from Long Island Sound. Lines of steamers run to New York City. New Haven lies in the direct line of railway communication, about one-third of the way from New York to Boston. In point of manufactures, New Haven is the chief city in the state, outranking even Hartford. Among the leading articles of manufacture are cutlery, shelf hardware, firearms, ammunition, watches, clocks, automobile bodies, rubber tires, clothing, and machinery of various descriptions. Fruits and vegetables are canned on a large scale. Though known popularly as a college town, New Haven is also an industrial center. Of a population in 1920 of 162,519, 45,686 were of foreign birth, and 35,000 were wage-earners in the various manufacturing establishments.

New Haven was settled in 1638 by a colony of London Puritans, led by their first governor, Theophilus Eaton, and their pastor, John Davenport. A tract of land, accompanied by a promise not to terrify, disturb or injure the settlers, was bought from the Indians for a highly tempting assortment of knives, hatchets, spoons and coats. In the government that was set up church members and none others were permitted to take part. Despite protest the infant colony was united with Connecticut in 1662. The city of New Haven was incorporated in 1784. In 1801 it was made a joint capital with Hartford, an arrangement that continued until 1873. Yale College was removed from Saybrook in 1717.

The early settlers laid out a public square in which they secured their cattle at night and in which they buried their dead. The main streets of the city still radiate from this square, now known as the Old Green. Nobody knows how long since the last Indian pitched his tepee here or how many people lie buried beneath the green sward. Through the efforts and example of James Hillhouse, a wealthy citizen, a great number of elm trees were set out along the principal avenues. They formed long, graceful aisles of vernal beauty, gaining for New Haven the name of "The City of Elms." Many of the original elms have died, but other trees have been planted to replace them. As might be expected, the educational system of the city is one of the most efficient in New England. The Hillhouse High School is named for the benefactor of the city. The public library shelters more than 60,000 volumes. Early documents and antiquities are preserved in the archives of the New Haven Colony Historical Society. Many noted men have been connected with the life of the city. Roger Sherman, United States Senator from Connecticut, was the first mayor. The graves of Noah Webster, Theodore Winthrop, Eli Whitney, F. B. Morse, and many a Yale celebrity may be seen in the old

elm-sheltered churchyards. See YALE; CONNECTICUT.

New Jersey, one of the original thirteen states of the American Union. The name is derived from the Isle of Jersey in the English Channel. The state occupies a peninsula of irregular shape between the Delaware River and Bay on the west and the lower Hudson and the Atlantic on the east. Its next door neighbors are New York, Pennsylvania, and Delaware. The state has but one artificial boundary,—a straight line forty-eight miles in length, from river to river on the northwest. The area, including inland waters, is 8,224 square miles.

TOPOGRAPHY. The northwestern part of the state consists of low mountain ranges and parallel spurs running at right angles to the Delaware River. The greatest elevation in the state is High Point, 1,804 feet above sea level. It is a region of wooded ridges, long valleys, blue vistas, and lakes. The Kittatinny Mountains are succeeded to the southeastward by the highlands, and the highlands by a narrow piedmont or foothill region. The last and largest, and a characteristic division of the state, is a coast plain running from Sandy Hook to Delaware Bay. It is from ten to twenty miles wide. It includes the noted pine barrens, a district well known to botanists as the home of the pyxie or flowering moss and other plants seldom found elsewhere.

MINERALS. The foundation of the state is granite, gneiss, and sandstone. Above these, geologically speaking, are slates, limestones, and marbles. Trenton limestone takes its name from an exposure at Trenton. Building stone, slate roofing, lime, and cement are obtained in the highland region. There are mines of lead, zinc, iron, copper, and graphite. Sand suitable for glass, potter's clay, brick clay, and marl are found. Nearer the ocean, the rock formations dip far beneath the surface.

AGRICULTURE. The key to the industries of New Jersey must be sought in the natural resources, the unusual facility for transportation, and the situation between the two cities of New York and Philadelphia. Staple crops, as corn, wheat, rye, oats, buckwheat and hay, all do well, but the total value does not exceed $15,000,000, not more than is produced by a single county in the food-producing region of the north central States. A variety of soil, forty-five inches of rainfall, a mild climate, and nearness to the great markets have led to small farms and a high state of cultivation. Owing to the proximity of New York and Philadelphia, dairies are devoted to the production of milk. Fruit is raised in large quantities. Peaches are the leading orchard fruit and the other fruits in the order of their money value are apples, strawberries, pears, blackberries and raspberries, gooseberries, quinces and plums. The swamps along the coast have been converted into valuable cranberry marshes. Truck farming, especially on the coastal plain, is an important industry.

Although the number of farms decreased 11.4 per cent between 1910 and 1920, production increased. This gain was due to the use of more scientific and intensive methods. The state agricultural college affords farmers every opportunity for extending their education by providing short courses as well as long courses and by extending their services through farm demonstrations. Under the Farm Demonstration Act of 1913 farm bureaus have been organized in 18 of the 21 counties, and the Smith-Lever Act of Congress of 1914 also provided for further extension of agricultural education.

MANUFACTURES. The manufactures of New Jersey like those of New York include about everything that is made in America. About 17 per cent of the population is actively engaged in manufacturing. Among the important industries are the smelting and refining of copper, refining of petroleum, the manufacturing of linoleum, pottery, sewing machines, silk, chemical products, rubber products, electrical machinery and supplies, woolen goods and toilet articles. According to the industrial census of 1920 the manufacturing industries organized under the factory system were:

Number of establishments	11,057
Persons engaged	603,889

Primary horse power	1,147,268
Capital invested	$2,835,577,127
Material used	$2,270,473,279
Value of products	$3,672,064,987

The wholesale dealers of New York and Philadelphia draw on Camden for chemicals, Elizabeth for sewing machines, New Brunswick for hosiery, Newark for leather, jewelry, celluloid goods and hats, Paterson for silks, Passaic for woolens, Jersey City for tobacco and soap and Trenton for pottery.

TRANSPORTATION. The state is unusually well supplied with the means of transportation. Active little boats follow the windings of the rivers and the ocean inlets, calling every morning at a thousand local piers for milk, butter, fruit, flowers and vegetables for the city market. A hundred suburban trains gather country produce at wayside stations. All the railways from the West have their terminals in Jersey City, where they reach New York by ferry and by tunnels under the rivers. In addition to the steam railways there are over 1,300 miles of electric lines in the state, giving unusual local transportation facilities.

POPULATION. The census of 1920 gave New Jersey a population of 3,155,900, an increase of 618,733 or 24.4 per cent during the decade. The average density of population in 1920 was 420 to the square mile. The urban population was 78.7 per cent of the whole as against 75.2 per cent in 1910. There were ten cities in the state having over 50,000 inhabitants and five of these had over 100,000.

EDUCATION. The public school system is in charge of a board of education consisting of eight members and a state commissioner who is assisted by four other commissioners and 21 county superintendents. The municipality is the unit for local administration. Schools are supported by a state educational fund and by state, railroad and local taxes. Industrial and agricultural courses are provided for by legislation and they have been introduced into both elementary and high schools of towns and cities; there is also provision for vocational training. In 1917 Rutgers College was made by act of legislature the State University of New Jersey. A college for women was affiliated with the State University in 1918. State normal schools are esablished at Mountclair, Newark, Trenton and Glassboro, and there are numerous schools for secondary and higher instruction under the auspices of various religious denominations. The most important educational institution in the state is Princeton University, which is described under its title.

INSTITUTIONS. Penal and charitable institutions are under the supervision of separate boards appointed by the governor. Hospitals for the insane are at Morris Plains and Trenton; the home for feebleminded is at Vineland; the state prison is at Trenton; there is a home for boys at Jamesburg, a reformatory at Rahway and a home for girls at Ewing. Several counties have parental schools and juvenile courts.

GOVERNMENT. The present constitution was adopted in 1844 and amended in 1877 and 1897.

The executive department consists of a governor, elected by the people for three years, a treasurer and comptroller electd by the legislature, and a secretary of state, attorney-general, prosecutors of pleas, clerks of court and boards of commissioners appointed by the governor.

The judicial department comprises the court of errors and appeals, consisting of a chancellor and justices of the supreme court and six other judges appointed for six years. Below this are a court of chancery, court for the trial of impeachments, a prerogative court, a supreme court and circuit and inferior courts.

Local government is administered by counties, cities and townships.

HISTORY. Aside from prehistoric man, whose stone implements and red bones are found at Trenton, and the historic Lenni-Lenape or Delaware Indians, whom the novelist Cooper commemorates in the *Last of the Mohicans*, the earliest settlers of New Jersey were Dutch and Swedes,—the former near New York; the latter along the Delaware. About 1655 the Swedes acknowledged Dutch control. In

1664 the entire region passed under English rule. The Indians gave little trouble. In 1758 they were placed on a reservation in the pines, the first in the United States. Later, they were removed to New York, and finally to Indian Territory.

A heavy immigration of Huguenot and Scotch-Irish set in. As a result, the opening of the Revolutionary War a century later found the colony decidedly Presbyterian and disposed to maintain the patriotic cause. Governor William Franklin, a son of Benjamin Franklin, gave his father and the good people of New Jersey no little anxiety by his Tory sentiments. He fled to New York City, where he continued to give the British army the benefit of his advice and to organize raids upon the colonists. The "Pine Robbers," as these foraging raiders were known, became a scourge. No less than a hundred skirmishes and pitched battles were fought on Jersey soil. The most noted were those of Trenton, fought December 26, 1776, and Princeton, January 3, 1777, giving rise to the Revolutionary cry of "Great news from the Jerseys." Washington wintered twice with his army at Morristown. The battle of Monmouth was fought June 28, 1778. The state was the third to adopt the Federal Constitution. During the Civil War, New Jersey furnished 88,305 men to the Union army, and advanced $3,000,000 for equipment, transportation and maintenance. During the World War, New Jersey sent 138,691 men to the army and 114,534 to the navy and marine corps. The total amount subscribed to Liberty and Victory loans was $773,058,900.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	7,514
Water area, square miles	710
Forest area, acres	2,000,000
Population (1920)	3,155,900
White	3,037,087
Negro	177,132
Asiatic	1,581
Foreign born	738,613
Chief cities:	
Newark	414,524
Jersey City	298,103
Paterson	135,875
Trenton	119,289
Camden	116,309
Elizabeth	95,783
Bayonne	76,754
Hoboken	68,166
Passaic	63,841
Atlantic City	50,707
East Orange	50,700
Perth Amboy	41,707
Number of counties	21
Members of state senate	21
Members of house of representatives	60
Salary of governor	$10,000
Representatives in Congress	14
Assessed valuation of property	$2,888,117,700
Bonded indebtedness	$80,000,000
Farm area, acres	$2,282,585
Improved land, acres	1,555,607
Corn, bushels	11,327,000
Potatoes, bushels	9,025,000
Oats, bushels	1,728,000
Wheat, bushels	1,539,000
Sweet potatoes, bushels	1,870,000
Rye, bushels	998,000
Hay, tons	424,000
Cranberries, barrels	179,000
Wool, pounds	109,000
Domestic Animals:	
Horses	87,000
Milk cows	151,000
Other cattle	73,000
Sheep	29,000
Swine	182,000
Manufacturing establishments	11,057
Capital invested	$2,835,577,127
Operatives	508,686
Raw material used	$2,270,473,279
Output of manufactures	$3,672,064,987
Iron ore, tons	551,688
Clay products, value	$26,624,369
Quarry products, value	$2,634,738
Miles of railway	2,461
Teachers in public schools	20,874
Pupils enrolled	678,734

New Liskeard, the capital of the Timiskaming district of Ontario, is situated at the head of Lake Timiskaming and on the Timiskaming & Northern Ontario Railroad, ten miles north of Cobalt. Lake steamers connect with the Canadian Pacific at Mattawa. The saw mills of Liskeard are the most important industrial establishments, but there are also government creameries, brick plants, flour and grist mills and foundries. The town has good public elementary and high schools, a library and a hospital. In 1921 the population was 2,268.

New London, Conn., a port of entry and one of the county seats of New London County, is on the Thames River 50

miles southeast of Hartford. This city was founded in 1646 by John Winthrop the Younger. Before the War of Independence and for many years after, it was an important whaling city. In the autumn of 1781 the city was attacked by an English force under Benedict Arnold; the wharves and a part of the city were destroyed, and a number of people were killed. Also the port was blockaded during the war of 1812. It has manufactories of silk, quilts, carpet lining, sheet metal, printing presses, radiators, gear-cutting machines, centering machines and submarine engines. It is the seat of the Coast Guard Academy, of a United States submarine base, of Connecticut College for Women, and has a public library (43,000 vols.) and has excellent grade and high schools. It also has a million dollar state pier with docking length and draught of water sufficient for large ocean liners. It is a popular convention city as well as an attractive summer resort. Sundays and holidays its popular Ocean Beach is thronged with people. The annual Yale-Harvard regatta is held on the Thames River. Population, 1920, 25,688.

Newman, John Henry (1801-1890), an English clergyman. He was born in London and died near Birmingham. He was graduated at Oxford in 1820 and was granted a fellowship, the income of which made him independent for a number of years. In 1824 he became a curate of the parish of St. Clement, Oxford. He remained a clergyman of the Church of England for nineteen years. During this period he traveled and wrote. He was noted as a man of devout spirit and highmindedness. It was during this time that he wrote the noted hymn, "Lead, Kindly Light." Later, religious doubts overtook him. He began to question the rightfulness of the English Reformation, and concluded by leaving the English Church for the Church of Rome. Although he was not followed by many persons his conversion to Catholicism was considered a severe blow to the Church of England, "the greatest triumph of the Catholic Church in England during 300 years." In 1846 he went to Rome where he was ordained a priest. He then returned to England and took up his residence at Birmingham where he established a religious house known as "The Oratory." From 1854 to 1858 he was rector of the Catholic University at Dublin. In 1879 he was created a cardinal deacon of the Catholic church. Among his friends, who did not, however, share his religious views, may be reckoned Matthew Arnold, Gladstone, and Charles Kingsley. Though a prominent figure in English politics, the subject of much controversy, and a prose writer of repute, it is probable that a thousand years from now he will be known chiefly as the author of the hymn mentioned above.

Newmarket, Ontario, on the Holland River and the Grand Trunk Railroad, is 27 miles north of Toronto. The industrial establishments of Newmarket produce flour, butter and cheese, clothing, office furniture, pencils, woodenware and machine shop products. The town is the commercial center of an extensive agricultural and dairying region. There are good public elementary and high schools and a library. Pickering College is located here, and the high school has a special agricultural branch. In 1921 the population was 3,626.

New Mexico, one of the southwestern states of the American Union, lying south of Colorado and north of Texas and Mexico. Texas and Oklahoma bound it on the east and Arizona on the west. With the exception of a slight extension on the Mexican boundary the state is nearly square. Its area is 122,634 square miles, making it the fourth state in the Union in size.

Surface and Drainage. The Rocky Mountains cross the northern boundary in the central part of the state and continue in an elevated plain or plateau which occupies the greater part of the area. The general slope is toward the southwest. The highest land is found in the mountain peaks in the north central part of the state, several of which exceed 12,000 feet in altitude. The southeastern part of the state includes a part of the state plain of Texas. Between this and the foothills of the Rocky Mountains lies the valley of the Pecos River, which is the only region in the state that has an altitude less than

3,000 feet. The valley of the Rio Grande extends across the central part of the state and west of this is the continental divide. The southwestern section is uneven and mountainous.

Considering its light rainfall New Mexico has an unusual number of rivers. The Rio Grande crosses the state from north to south and this and its chief tributary, the Pecos, which unites with it in Mexico, are the largest rivers in the state. The Canadian River crosses the northeastern section and the Gila, San Francisco and San Juan drain the western portion of the state into the Colorado. The lakes are temporary and most of them evaporate during the dry season.

Climate. The climate may be characterized as warm and dry. There are less than 30 cloudy and rainy days during the year; there are no extremes of heat and cold. However, there is in some regions a wide range of daily temperature. The mean winter temperature is 35° F and the mean summer temperature 71° F. The annual rainfall varies from 6 inches in the southwestern part of the state to 30 inches among the northern mountains. These mountains are subject to a heavy snowfall and the accumulation of snow supplies the rivers during the dry season. The climate is remarkably invigorating and New Mexico is a popular resort for those suffering from lung diseases.

Minerals. The mountains are rich in minerals and ever since the region has been known to white men mining has been the leading occupation. Coal is widely distributed but the mines near Raton and in Colfax County are the most extensively worked. A region in the northern part of the state in Santa Fe County, extending into Colorado, contains the only anthracite in the United States outside of Pennsylvania. Formerly coal was the most important mineral from the mining viewpoint but in recent years it has been exceeded by copper. Under normal conditions the copper production amounts to about nine million dollars annually. Gold, silver, zinc, lead, gypsum, iron and numerous other minerals are found; turquoise and other precious stones are also produced. The annual output of the mines aggregates about forty-one million dollars. In 1920 the United States geological survey reported the existence of a bed of salt whose total area exceeded 100,000 square miles. Nearly one-half of this bed is in the southeastern part of New Mexico awaiting further development.

Agriculture. About one-seventh of the area of the state is in farms. Most of these are found in the valleys among the mountains and in the irrigated sections. The average area of a farm in 1920 was 817 acres, showing that most of the farms are devoted to raising cattle, sheep and horses, for which the region is fairly well adapted, since grazing is good throughout the year. The leading cereal crops in the order of their value are corn, wheat and oats. Hay from the point of value is the most important crop. Kafir corn, beans and vegetables are grown in large quantities and in some regions sorghum and sugar cane are cultivated. The irrigated land is devoted largely to raising fruit, and excellent peaches, apricots, plums, pears and cherries are grown in the northern part of the state while apples and some quinces are extensively cultivated in the central part. The cultivation of grapes is also successful throughout the state. New Mexico contains large numbers of horses, cattle and sheep. Formerly it was one of the leading states in the production of wool, but it is now surpassed by a number of other states in this respect.

Irrigation is practiced on about two-fifths of the farms and the completion in 1916 of the Elephant-Butte Dam, by the United States Reclamation Service, greatly increased the facilities for irrigation. This dam is across the Rio Grande in Sierra County and the storage reservoir was at that time claimed to be the largest in the world, having an area of 40,080 acres, and a shore line of 200 miles with an average depth of 66 feet, sufficient water to irrigate 135,000 acres of land.

Manufactures. Manufactures are not important. They are related chiefly to the repairing of railway cars and locomotives, the production of lumber and lumber products. The production of flour and grist,

and printing and publishing, are also important.

TRANSPORTATION. There are over 3,000 miles of railroad in the state. About one-half of this mileage belongs to the Santa Fe system, which enters the state from the north and crosses it in a southerly and westerly direction. It also has a branch extending to the Gulf of Mexico. The other important lines are the Southern Pacific, the Denver & Rio Grande, The Chicago, Rock Island & Pacific, the El Paso & Southwestern and the New Mexico Central. The highways are under the control of a highway commission and are being extended and improved as rapidly as the financial condition of the state will permit.

POPULATION. The population in 1920 was 360,350, an increase of 33,049, or 10.1 per cent during the decade. The urban population in 1920 was 18 per cent of the whole as compared with 14.2 per cent in 1910. The average number of inhabitants per square mile in 1920 was 2.9; in 1910 it was 2.7. There are four cities in the state having a population of over 5,000. The population includes a large number of Spanish Americans, Mexicans and Indians. The former are descendents of the early white settlers who came into the territory from Mexico. Many of the Spanish intermarried with the Indians, creating a class known as Mestizos. There are about 22,000 Indians—Navajo, Apache and Pueblo—living upon reservations. Most of these Indians are now self-supporting.

EDUCATION. Public education is in charge of a department of education with a superintendent of public instruction at the head. There is also a division of vocational education with state supervisors for agriculture, home economics and trade and industries. The problem of rural schools presents many difficulties owing to the small number of inhabitants and the prevalence of the Spanish language. In 1919 a compulsory law was enacted requiring children from six to sixteen to remain in school, with the provision that "those from fourteen to sixteen may be permitted to leave school and engage in work." The teaching of English in the public schools was made compulsory. The high schools are being standardized. The state university at Albuquerque and the agricultural college at Mesilla Park are the leading state institutions. There are normal colleges at Las Vegas and Silver City; the school of mines is located at Socorro and a military institution is at Roswell. There are 26 Indian schools within the state maintained by the United States government. These give instruction to over 75,000 pupils.

The University of New Mexico at Albuquerque was authorized by the territorial legislature in 1889 and was opened in 1892. It maintains teachers' and preparatory departments, a commercial school, colleges of letters and arts and sciences and engineering, a summer school and schools of art and music. The faculty numbers 35 and the enrollment is approximately 600. The institution is coeducational.

The Museum of New Mexico, located at Santa Fe, occupies an old palace of the governors built about 1630. It contains one of the most remarkable collections illustrating American archeology within the United States, and a noted library of work on general linguistics. The Archeological Institute of America maintains a special school of American research at this museum.

INSTITUTIONS. The hospital for the insane is located at Las Vegas; there is a miners' hospital at Raton; the school for the blind is located at Almogordo; an institution for the deaf and dumb is at Santa Fe; a reform school is at Springer; and the state penitentiary is at Santa Fe.

GOVERNMENT. The constitution under which the state was admitted into the Union was adopted in 1911. It is more elaborate than constitutions of older states because it contains numerous provisions that older states have enacted in statutory laws.

The legislative department consists of a senate of 24 members and a house of representatives of 49 members. The legislature meets biennially.

The executive department includes a governor, lieutenant-governor, secretary of state, auditor, treasurer, attorney-general, superintendent of public instruction and

commissioner of public lands, all elected for two years.

The judicial department includes a supreme court, district courts, county probate courts and courts of justices of the peace. The usual local forms of government for cities, counties and townships prevail.

History. The region of New Mexico and Arizona was first visited by Spaniards from Mexico early in the 16th century. These explorers were attracted to the country by the fabulous stories of a peculiar civilization and great wealth which were handed down as traditions. The region was the home of the Pueblo and Navajo and these Indians offered a strenuous resistance to the encroachments of the whites. Nevertheless white settlers gradually increased. Santa Fe was founded about 1616. New Mexico became independent from Spain in 1821, and the region became a Mexican province. An active trade sprang up between the settlers in what is now New Mexico and the frontier forts of the United States—Kaskaskia, Illinois, and Independence, Missouri. This overland trade opened the famous Santa Fe Trail. Santa Fe was occupied by United States troops during the Mexican War and the treaty of Guadalupe Hidalgo in 1848 made the territory of New Mexico part of the United States. Later, Colorado and Arizona were organized as territories, and the boundaries of New Mexico were fixed as they now remain. In 1906 an attempt was made to admit Arizona and New Mexico as one state but the voters of Arizona opposed the plan and statehood was delayed for a number of years. The state was finally admitted January 1, 1912, becoming the 47th state. In 1915-16 New Mexico with other states in the southwest experienced considerable trouble because of the disorders in Mexico during the Carranza regime.

Statistics. The following are the latest reliable statistics available:

Land area, square miles	122,503
Water area, square miles	131
Forest area, acres	5,500,000
Irrigated area, acres	696,119
Population (1920)	360,350
White	334,673
Negro	5,733
Indian	19,512
Foreign born	29,077
Chief cities:	
Albuquerque	15,157
Santa Fe	7,236
Roswell	7,033
Raton	5,544
Number of counties	29
Members of state senate	24
Members of house of representatives	49
Salary of governor	$5,000
Representatives in Congress	3
Assessed valuation of property	$363,721,981
Bonded indebtedness	$3,997,500
Farm area, acres	24,409,633
Improved land, acres	1,717,224
Corn, bushels	6,409,000
Wheat, bushels	3,088,000
Oats, bushels	1,690,000
Beans, bushels	830,000
Potatoes, bushels	296.000
Hay, tons	499,000
Wool, pounds	15,528,000
Domestic Animals:	
Horses	225,000
Milk cows	91,000
Other cattle	1,406,000
Sheep	2,666,000
Swine	85,000
Manufacturing establishments	387
Capital invested	$15,226,253
Operatives	5,736
Raw material used	$7,727,483
Output of manufactures	$17,856,602
Copper, pounds	14,460,000
Gold, value	$184,000
Silver, ounces	671,000
Lead, pounds	500,000
Zinc, pounds	20,000
Miles of railway	2,978
Teachers in public schools	3,009
Pupils enrolled	85,269

New Orleans, La., the largest city in the South, the oldest in the lower Mississippi Valley, and the second port of the United States, is the county seat of Orleans Parish. It is on the Mississippi River, 110 miles from the Gulf of Mexico, 639 miles south of St. Louis, Mo., and 140 miles southwest of Mobile, Ala. Rail transportation is provided by the Louisville & Nashville, Illinois Central, New Orleans Great Northern, Texas & Pacific, Yazoo & Mississippi, New Orleans Southern & Grand Isle and other railroads. The city has steamer connection with New York, Europe, the Orient, the West Indies and Central America.

Description. New Orleans has a total

area of 196 square miles, and occupies both banks of the river, though the greater part is on the east bank. Though now extending along the Mississippi in the form of a large "S", the city for many years lay along a single great bend and therefrom derived its popular name—the "Crescent City." The longer streets come down to the water's edge, or to the high levees that protect the city from inundation, as it is below the water level of the Gulf of Mexico and below high water level in the Mississippi. Several passenger and freight ferries connect the two banks of the stream.

New Orleans offers striking contrasts, industrial, social, architectural. A number of the little one-story houses of the French and Spanish settlers still stand and are still in use; and the city has many modern skyscrapers, rising as high as twenty-three stories. In the old French quarter of the city are many houses almost hidden beneath luxuriant, semi-tropical vegetation — such houses as can be seen only in the older portion of Quebec or in France. The Spanish who held New Orleans at different times also left many relics of their dominance. One of the most conspicuous examples is the Cabildo, the old Spanish Court, now housing the Louisiana Historical Museum. New Orleans has 905 acres of parks and parkways; in some of the parks are small bodies of water around which grow giant, moss-fringed oaks, and several varieties of semi-tropical trees. Jackson Square, formerly called the Place d'Armes, was the scene of the public reception of General Jackson after the Battle of New Orleans, 1815. The French Market is an interesting spot, as are City Park, Audubon Park, Beauregard Square (the old slave market), Hotel de la Marine (an old rendezvous of pirates), Chalmette National Cemetery and Battlefield, and the ruins of an old Spanish fort, on Lake Pontchatrain.

Buildings and Institutions. Among the older buildings the most conspicuous, besides those mentioned, are the Convent of the Ursuline Nuns, St. Louis Cathedral, Madame John's Legacy, Absinthe House, the old Archbishopric and Napoleon House. Among the newer buildings are the Cotton Exchange, court house, Y. M. C. A., Y. W. C. A. and hotels and theaters.

New Orleans has more than eighty grammar and kindergarten schools, a boys' high school and two girls' high schools, an industrial school for girls, an evening high school and a normal school. Other notable educational institutions are the Delgado Central Trades School and Loyola and Tulane universities. The city has fifteen libraries and many private and commercial schools.

Commerce and Industry. New Orleans is the natural commercial outlet of the Mississippi Valley, and the imports and exports are second only to those of New York. The water frontage is 41 miles, and 11 miles will be added by the Gulf-Level Inner Harbor Canal which was opened to traffic in May, 1923, and connects the Mississippi River and Lake Pontchatrain. Dry docks, floating derricks, harbor railroads, grain elevators, wharves and warehouses have been built, and further port improvements are in prospect. More than half the bananas imported into the United States are received here; twenty per cent of the cotton exported leaves this port; almost all the coffee that comes into the United States is received at New Orleans and New York; and great quantities of live stock, grain and general merchandise are shipped from here each year.

Sugar and petroleum refining are important New Orleans industries; coffee roasting and rice cleaning are others. The city also has manufactories of iron and steel, bags, copper and tin ware, shoes, cotton goods and boats.

History. New Orleans was founded by Jean Batiste de Bienville in 1718 and was named for the Duke of Orleans. It was made the capital of the French territory in 1723, and in 1762 the whole of Louisiana was ceded to the Spanish. When, in 1803, Louisiana passed into the possession of the United States (See Louisiana Purchase), New Orleans had 8,056 inhabitants. A city charter was secured in 1805, and the city grew steadily after that time. In 1920 the population was 387,219.

Newport, Ky., the county seat of Campbell County, is situated at the junction of

the Licking River with the Ohio; the former separates Newport from Covington, Ky.; the latter separates it from Cincinnati, Ohio; but with both these cities it has, by way of numerous bridges, hourly electric railway connection. The city is served by Ohio River steamers and by the Louisville & Nashville and Chesapeake & Ohio railroads.

Though primarily a residential suburb, Newport has some important manufacturing interests. The principal products of its factories are sheet-iron, metal roofing, rails, printed matter and screens.

Newport is well laid out with broad, well paved and shaded streets, and its cleanliness and quiet are very attractive. The most notable buildings are the public library, high school, Masonic Temple and post office. On the hills behind the city is a United States military post, Fort Thomas. In 1920 the population of Newport was 29,317.

Newport, a city on the island of Rhode in Narragansett Bay. Because of its picturesque surroundings, the many points of interest of easy access, and its unusual facilities for bathing, boating, and kindred amusements, Newport has become a noted and fashionable summer resort. This old Rhode Island town, founded by colonists from the party of Roger Williams in 1639, is very picturesque with its narrow streets and quaint, old-fashioned houses; the new section, built on the side of the island facing the ocean, is made up of handsome summer homes, many of them veritable palaces. Three forts guard the harbor, and on an island in the harbor are the United States Naval Training Station and the Naval War College. The United States Naval Torpedo Station is situated on Goat Island nearby.

Newport has many buildings of historic interest: a synagogue said to be the oldest in the United States; the Old Stone Mill perhaps built by the Norsemen in medieval times, though some people believe it to be the windmill of Benedict Arnold; Vernon House, Rochambeau's headquarters; and Sayer House from which were directed the operations of the British Army in 1777. Some of the natural features of interest are a huge cleft in the rocks called Purgatory, the Spouting Rock which sometimes sends up a jet of water fifty feet in height, and the Hanging Rocks. Before the Revolution Newport had a commerce which rivalled that of New York, but now fishing is the only industry of great importance. The population in 1920 was 30,255.

Newport News, Va., a port of entry, is on the Thames River and Hampton Roads, and is the terminus of the Chesapeake & Ohio Railroad. The fine harbor and the shipping facilities have made this city an important commercial center. It ranks fourth among American cities in the shipment of grain. It contains one of the largest ship yards in the world, employing more than 10,000 men; it has three huge dry docks, and manufactures include lumber, furniture, iron, shoes, shirts and knit goods. There are grain elevators, woodworking mills and coal wharves. Many lines of coasting vessels call here, and the city has direct ship connections with the Pacific Coast and with Europe, South America and the Orient. Newport News is another example of the rapid growth of American industrial cities. It was incorporated as lately as 1896, but had in 1920 a population of 35,596.

New South Wales. See AUSTRALIA.

New Thought. See CHRISTIAN SCIENCE.

Newspaper, a printed sheet giving the news. Newspapers may be classed as general or special. General newspapers give not only local news, but the doings of the world at large. They contain usually local news and announcements, press dispatches, correspondence, editorial comment, and advertisements. Special newspapers are devoted to some particular subject as Presbyterianism, coal mining, the grocery trade, temperance, law, literature, etc. A daily newspaper contains frequently as much reading material as the ordinary volume of fiction that lists for a dollar and a half, but it differs from the magazine and the book in that it is never bound.

The modern newspaper has grown out of official bulletins issued by various governments. The Romans were accustomed to post bulletins giving an account of the prog-

ress of wars, the acts of the Senate, the opinions of public speakers, and a record of trials, punishments, deaths, public sacrifices, and the like. Proceedings were taken down by shorthand writers and were afterward written out by clerks for posting.

The earliest printed newspaper was the Pekin *Gazette* first issued about 1340. It is still printed. It is an official journal having rather the form of a pamphlet. It contains from twenty-five to eighty leaves of coarse paper, printed on one side with rude wooden type. The earliest European newspapers were published in Germany. They appeared somewhat irregularly at Augsburg, Vienna, Ratisbon, and Nuremberg. Among other news was an announcement of the discovery of America and a discussion of its importance, or otherwise, to the rest of the civilized world. A file of sixteenth century Venetian papers covering a period of sixty years is preserved in a library at Florence. Regular newspapers were established in Germany before they were in France and England. The Frankfurter *Zeitung* was established in 1615. At the end of the seventeenth century, there were thirty daily newspapers in Germany. The *Allgemeine Zeitung,* founded in 1798, is probably the most important German newspaper. German papers do not rank high, however, either in number, efficiency, or popularity.

Printed bulletins seem to have appeared in England as early as 1462. There were several newspapers in Cromwell's time. Commercial advertisements appeared as early as 1652. The first London daily, the *Daily Courant,* appeared in 1709. *The Tatler, The Spectator, The Rambler,* and other sheets famous in literature appeared in newspaper form. The London *Times,* said to be the most influential paper in the world, was founded under another name January 18, 1785. Other important English papers are *The Chronicle, The Post, The Telegraph, The Standard, The Graphic, The Pall Mall Gazette,* etc.

The Dublin *News-Letter,* the first paper appearing in Ireland, was established in 1685. Passing by other Scotch papers, it may be said that the Edinburgh *Gazette* was founded in 1699 and the Glasgow *Herald* in 1782. The first French newspaper dates from 1631. The most important paper in France is probably the *Temps. Le Petit Journal* has a daily circulation of a million copies.

The first American newspaper appeared at Boston September 25, 1690. It was printed on a single sheet, eleven by fourteen inches, and was folded once. Three pages were printed, the fourth page was plain. There were in all six eleven-inch columns of reading matter. The editor called it *Publick Occurrences.* He proposed to furnish the country with the newspaper once a month, or, "if any glut of occurrences appear, oftener." Anticipating the difficulty of getting reliable information he proposed naively to print from time to time the names of such as gave him false information. Some words in the paper being construed as a reflection upon the British authorities, he was forbidden to continue the publication. The publication of the Boston *News-Letter* was begun April 24, 1704, by John Campbell, postmaster and bookseller. It was printed on a sheet of foolscap paper. It appeared regularly. Inside of forty years the subscription list had run up to three hundred. In 1719 Campbell lost his office. His successor began the publication of a rival paper, the Boston *Gazette.* A war of editors set in and continued until the *News-Letter* went out of existence, which it did when the British evacuated Boston in 1776. In 1721 the *New England Courant* was established in Boston. It is of interest because it was published by a brother of Benjamin Franklin and was printed in the office in which young Benjamin learned his trade.

Speaking for the United States alone, the first daily paper appeared in Philadelphia in 1784. It published Washington's farewell address. The first paper in the Northwest Territory was *The Sentinel,* founded at Cincinnati in 1793. The first religious newspaper was *The Recorder,* published at Chillicothe, Ohio, in 1814. The first agricultural paper, *The American Farmer,* was established in 1818, at Baltimore. The first anti-slavery paper, *The Genius of Universal Emancipation,* was published in 1821 at Mount Pleasant, Ohio.

The first penny paper was *The Sun,* published in New York in 1833. The first American newspaper boys were employed to sell *The Sun.* It was at first a little sheet about ten inches square. The first illustrated daily, *The Daily Graphic,* was launched in New York in 1873. The oldest newspaper in the United States still published is said to be the *Maryland Gazette* of Annapolis, founded in 1745. Next in order is the *Hampshire Gazette,* founded at Portsmouth in 1756. The Pittsburg *Gazette* and the Cincinnati *Gazette* are the oldest papers published west of the Alleghany Mountains. As late as 1810, there were no newspapers west of the Mississippi and no dailies in the United States that had a circulation greater than nine hundred.

The Sunday newspaper, as an American institution, is of comparatively modern origin. Prior to the year 1850 there was no publication of that character in the United States. About that time Dr. J. A. Adams of Boston issued the *Sunday Morning News,* of which H. L. Champlin was the editor. It was opposed by the churches but managed to exist for a few years and then died a natural death.

The first Sunday newspaper which might properly be called the pioneer of its class was issued in New York by the *Daily Herald.* One Saturday, shortly before the outbreak of the Civil War, James Gordon Bennett, the publisher, found a large amount of set type on the standing "galleys" in his composing room. This type had been crowded out of the Saturday paper, and he instructed his mechanical staff to use this matter, supplemented by anything fresh that could be secured, and issue it as a Sunday edition of the *Herald.* The publication of a Sunday newspaper was considered thoroughly disreputable at that time, and the other New York dailies did not follow Bennett's example until the progress of the war between the states compelled them to do so in response to popular demand for Sunday news from the battle fronts.

The metropolitan newspaper of the twentieth century is produced by a costly and complicated organization, with a capitalization often reaching into the millions. The daily and Sunday issues necessitate a vast outlay that must be met by correspondingly large revenue. This is produced largely through the use of the advertising columns, and the growth of the European and American newspaper press has been due to the growth of advertising as an adjunct of business. The advertising columns are the vital arteries of the newspaper.

The modern city newspaper, with its hundreds of thousands of circulation, its wonderful mechanical equipment, its palatial publication house, its trained writers and specialists in every field, and its correspondents in every capital, is a development of the last fifty years, and its progress was sudden and swift in the opening years of the present century. The extension and perfection of the electric telegraph, increased railway and postal service, the multiplication of ocean cables, the invention of the telephone and of wireless communication, have all contributed to the progress of the press. They have widened the field for the collection of news, and have quickened the process of getting it to the people; while the machinery employed in the production of newspapers has been continually improved. Thus the typewriter has succeeded the lead pencil of the reporter, and news "copy" is prepared more rapidly and more accurately for the printer. Typesetting machines have superseded the setting of news type by hand, and the stereotyping process has facilitated the printing of the news on the improved presses of the present day. The old Washington hand-press, with its chamois ink-pad or its 10-inch roller, has given place in the newspaper pressroom to magnificent batteries of presses, each unit of which, making 350 revolutions a minute, feeds upon an endless sheet of white paper and prints, folds, and delivers, at the motion of one man's hand 240,000 eight-page papers an hour. These are but a few of the mechanical triumphs of twentieth-century journalism.

Modern newspapers have brought the people of rural districts into closer contact with urban life and have created among them a demand for news, first, of a special

character, such as market and financial reports; and finally for all the general information of current events, which is the distinctive feature of the daily paper.

An important result of newspaper development in America has been the cultivation among the masses of a keener news sense, an evidence of intelligent appreciation of the affairs of the world, which formerly was confined to the few, as it still is in many foreign countries. In response to a growing demand for special information, the modern newspaper is now subdivided into departments. This began with the segregation of news items from Washington and cablegrams from Europe in certain columns under distinctive headlines. Today the daily newspaper is a collection of departments. There are sports, music, and police-court records facing society news and gossip. Railroad and financial news and the wholesale and retail market quotations are side by side with labor news and the International Sunday School lesson. Every department is in charge of a specialist. In the language of a popular writer:

"The newspaper of today is a library. It is an encyclopaedia, a poem, a biography, a history, a prophecy, a directory, a timetable, a romance, a cook book, a guide, a horoscope, an art critic, a political record, a ground plan of the civilized world, a low-priced 'multum in parvo.' It is a sermon, a song, a circus, an obituary, a picnic, a shipwreck, a symphony in solid brevier, a medley of life and death, a grand aggrandization of man's glory and his shame. It is in short a birdseye view of all the magnanimity and meanness, the joys and griefs, the births and deaths, the pride and poverty of the world. And all for two or three cents."

The total circulation of newspapers and periodicals in the United States in 1919, according to the census of manufactures, was 220,008,686 copies. Reports for 1922 show that there were 2,382 daily and 13,660 weekly newspapers in the United States; 135 dailies and 973 weeklies in Canada. The aggregate daily circulation in the United States and Canada was as follows: Morning papers, 12,000,000; evening papers, 19,000,000; Sunday papers, 20,000,000. According to the last available report there were 720 morning dailies, 1,721 evening dailies, and 604 Sunday papers in the United States. The revenues of these papers, in a recent year, were as follows: From subscriptions and sales, $192,819,519; from advertising, $373,501,890.

See PERIODICAL.

Newt, a tailed animal of the frog family. The newt is related closely to the salamander. There are many species. The life history of the newt is much the same as that of the frog, save that the newt does not lose its tail. The English newt never ceases to frequent the shallow, sluggish waters of ditches and ponds. It is not to exceed three inches long. It lives on worms, larvae, insects; it is a harmless, unattractive creature, for which no particular use has been found, unless, indeed, it devours the wrigglers of mosquitoes. The common American newt deposits usually one egg at a time on a water plant. This, in May or June. In twenty or thirty days, according to temperature, the tadpoles appear. By August the tadpole may have become a tiny, four-legged creature with branching outer gills. Late in autumn the young newt loses its gills, takes to the woods, and secretes itself in some damp spot under a log or beneath leaves. At this stage it has a beautiful red color. Several years are required to attain maturity. The adult is of an olive green color with orange-colored spots along the sides. It is about three and one-half inches long. It takes to the water when the breeding season comes. The English newt of literature is a warty creature, about six inches long, living in ditches and ponds on aquatic insects, tadpoles, and the like. It swims by means of its tail. The female deposits eggs singly on aquatic plants. The witches described in Macbeth, it will be remembered, put into their bubbling cauldron:

"Eye of newt and toe of frog,
Wool of bat and tongue of dog."

Newton, Sir Isaac (1642-1727), an eminent English mathematician and scientist. It is noteworthy that Newton's birth occurred in the year of Galileo's death. As a lad he was fond of tools and of

making playthings. A sundial constructed by him still stands at Woolsthorpe where he was born. Newton was well educated in a grammar school and in the University of Cambridge. He appears to have been a scholar by nature, with abundant leisure to follow his inclinations. He was made a professor of mathematics at Cambridge. At various times he occupied a seat in Parliament, and in 1696 he was appointed warden of the English mint, a connection which was maintained until the time of his death. His remains lie in Westminster Abbey. Newton's principal published works are his *Optics,* 1704, and *Principia,* 1713. Newton's note as a man of science rests on his enunciation of the Universal Law of Gravitation, according to which every particle of matter in the universe attracts every other particle with a force proportional to the product of their masses, and inversely proportional to the square of their distance apart.

An unlikely story runs to the effect that, while lying under an apple tree, Newton saw an apple fall, and that his great discovery is due to his reasoning as to why the apple should fall in one direction rather than another, and really why it should fall at all. The first question to be settled of course was one of whether its move was due to some force within the apple or due to a force outside of the apple.

Newton was an eminent mathematician. He arranged the algebraic formula known as the binomial theorem, studied the conic section known as the hyperbole, and laid the foundation for the college subject known as calculus. He was a man of industry and perseverance. A careless servant having overturned a light that burned up papers which he had spent twenty years in preparing, it is said that Newton set himself at work without delay to reproduce them.

See GRAVITATION; ASTRONOMY.

Newton, Mass., an industrial city, is on the Charles River and the Boston & Albany Railroad, seven miles west of Boston; with the latter city it has half-hourly electric railway connection. Newton is a residential suburb of Boston, but it has manufactories of silk, worsteds, rubber, paper boxes, cordage, railroad signals and other articles.

The city has a system of beautiful parks, including the Metropolitan Park Reservation of 119 acres. Besides the public schools, a list of Newton's educational institutions includes Boston College, Newton Theological Institution, Saint John's Industrial School for Boys, Mount Ida and Lasell Seminaries and the Allen School for Boys.

Newton was founded in 1630 as a part of Cambridge and was separately incorporated as New Cambridge in 1688. A city charter was granted in 1873. In 1920 the inhabitants of Newton numbered 46,054.

New Year's Day, the first day of January. It was observed as a holiday in Rome. Ovid speaks of refraining from lawsuits and strife, and of smoking altars and white robed processions to the capitol. It appears from other sources that the exchange of greetings, the giving and receiving of presents, wishing good luck, masquerading, and feasting were features of New Year's Day in the time of the Empire. It appears to have been the one great holiday observed throughout the entire Roman Empire. The Persians celebrate their day by giving each other presents of eggs. There is a tradition among them that even the most careless trim the beard and take a bath on New Year's Day. Among the Saxons, New Year's was a day of wassail, drinking, and feasting. The French called on each other for presents. The Scotch gave New Year's presents. One of Burns' most characteristic poems bears the long title of "The Auld Farmer's New Year Morning Salutation to His Auld Mare Maggie on Giving Her the Accustomed Rip of Corn to Hansel in the New Year."

The observance of New Year's as a day of calling and social intercourse was introduced into the colonies by the Dutch of New York. The presidents, beginning with Washington, have been accustomed to receive on New Year's Day; but the good old Knickerbocker custom of making New Year's calls is falling into disuse.

In St. Petersburg, Moscow, and other Russian cities, New Year's is a great day.

According to the custom of the Greek Church, the morning is occupied with religious ceremonies. Boxes of candies are regarded as appropriate presents. Many of the wealthy send their bonbons in costly caskets of the choicest porcelain or of enameled silverware. The Japanese and the Chinese make much of New Year's. They decorate their doorways with boughs and flowers to debar the entrance of evil spirits.

To primitive people living in the northern hemisphere, or anywhere but on the equator for that matter, the changing height of the noonday sun must have had a fascination. All through the spring, the sun mounted higher each successive day. At noon of midsummer, the sun reached its highest point in the heavens. On that day the sun god in his glowing chariot made his longest and highest trip. Thereafter, day by day, the path of the sun grew shorter and lower. All through the autumn we may fancy the untutored mind filled with awe, if not fear, lest the sun sink in the west never to rise in the east again.

The changing length of day and night, too, were phenomena that must have impressed the mind of primitive man. The longest day, the shortest day, the spring day and night of equal length, the autumnal day and night of equal length,—either one of these four days, or else the day following one of these days, is a natural, an astronomical, beginning of a new year.

The year of historical nations began at the vernal equinox. The Roman pontiffs, whose business it was to see to it that festivals were celebrated on the proper date, were not sufficiently skilled to drop a day now and then (leap year); so as the centuries went by their New Year's day crept away farther and farther from the equinox until, in Caesar's day, it fell in June. This ruler shifted the New Year to the present season by adding eighty days to "the last year of confusion," and borrowed the Egyptian leap year to keep New Year's Day in one place thereafter. Persia holds to March 21st. Modern countries have adopted Caesar's date for the beginning of the year. The Christian church clung to the vernal equinox for centuries.

See HOLIDAYS.

New York, "The Empire State" and the wealthiest and most populous state in the American Union, is one of the north Atlantic group. The northern boundary is formed by the Dominion of Canada; the eastern by Vermont, Massachusetts, Connecticut and the Atlantic Ocean; the southern by New Jersey and Pennsylvania and the western by Pennsylvania and Ontario, from which it is separated by the Niagara River. Part of the northern boundary is formed by the St. Lawrence River and the deep channel of Lake Ontario. Lake Champlain, a part of which belongs to New York, forms the northern part of the eastern boundary, and Lake Erie touches the state on the west. The greatest length from east to west is 326 miles and from north to south 312 miles. The area is 49,204 square miles, of which 1,550 square miles is water surface. The general outline of the state resembles a triangle with the apex at New York City.

SURFACE. The surface of New York although complex, consists of a number of well defined regions. In the northeast is the Adirondack region, occupying about 5,000 square miles, covering the north and east portion of the state and extending south to the Mohawk Valley. This region is the most striking physical region of the state. It is characterized by hills and low mountains covered with dense forests and containing numerous clear lakes and sparkling streams. The region is celebrated for its wild and beautiful scenery and is a favorite summer resort. Over two million acres of the forest areas have been formed into a state preserve, which is under the care of trained foresters. (See ADIRONDACKS). The Catskill Mountains occupy a small area in the southeastern part of the state to which they impart a variegated scenery. The Catskills constitute a group, rather than a range of mountains. The highest peaks are about 3,000 feet in altitude, the sides are covered with forests and between the mountains are many fertile valleys. This region also is a favorite resort for city dwellers.

Between the Catskills and the Adirondacks is the valley of the Mohawk, which extends from Lake Ontario to the Hudson

NEW YORK

THE EMPIRE STATE

1. Niagara Falls
2. Erie Canal
3. Salt
4. Quarrying
5. Hay
6. Dairying
7. Gardening
8. Machinery
9. Clothing
10. N. Y. City Skyline
11. Commerce
12. Statue of Liberty

River near Troy. This is a narrow, level valley, whose position made possible the construction of the Erie Canal. In early times it also was the natural path leading from the eastern colonies into the great interior of the country. The central and western part of the state is occupied by a low plateau, which has a rolling surface and is covered with a fertile soil. In the southern counties this plateau is broken up into hills and valleys, making some sections quite irregular. North of the plateau is the lake plain which has a gentle slope toward Lake Ontario. Long Island, which belongs to New York is low and level.

Lakes and Rivers. New York is drained by three great bodies of water—the Atlantic Ocean, and the St. Lawrence and the Mississippi rivers. The Hudson River, with its tributaries, is the most important stream lying wholly within the state, and it drains a large area into the Atlantic. The Delaware and the Susquehanna rivers have their sources in the state and in the southwestern part the Allegheny River drains a small section into the Ohio. The Genesee, the Oswego and the Black are the chief streams flowing into Lake Ontario. The first flows from the southern border across the state. A few small streams flow into the St. Lawrence and on the west the Niagara River separates New York from Ontario.

Hundreds of lakes distributed over the state lend freshness and beauty to the landscape. Among these, Lake George, a short distance south of Lake Champlain, is widely known for its beautiful scenery. The lake is about 40 miles long and surrounded by mountains. It is one of the choicest gems in America, if not in the world. Occupying the plateau in the west central part of the state are a number of long narrow lakes, because of their shape and arrangement generally known as the Finger Lakes.

The most important of these are Canandaigua, Seneca, Cayuga and Keuka. Farther north is Lake Oneida, and in the southwestern part of the state is Lake Chautauqua, widely known as a summer resort.

New York is rich in natural scenery. Numerous cascades and waterfalls furnish water power and lend beauty to the regions in which they are found. Many of the lakes are surrounded by forests and some of the streams have worn deep gorges where they pass over escarpments or through mountain regions. The most widely known of these is that formed by the Hudson in the region of the Catskills. Ausable Chasm in the eastern part of the state is visited by many tourists. Of course the greatest of all these objects of interests is Niagara Falls, part of which belongs to New York. See Niagara River and Falls.

State Parks. In addition to the forest preserves, New York has two other parks, one of which, the Palisades Interstate Park, is shared with New Jersey. This park comprises 36,000 acres, 1,000 of which are in New Jersey. It embraces the palisades and cliffs along the Hudson River and extends about 12 miles on the west bank of the river from Fort Lee, New Jersey, to Palisades, New York. The park is in charge of a commission and is a desirable pleasure ground for the inhabitants of New York City and surrounding towns. It maintains the largest vacation camp in the world, a favorite location with week-end recreationers.

The Allegheny State Park was authorized by the legislature in 1921. It includes all of the land south of the bend of the Allegheny River in New York and has an area of over 65,000 acres. Grouse, squirrels, rabbits and, frequently, black bear are found in this area, and it is the purpose of the commission to make the park a pleasure ground for all the people.

Climate. New York has a wider range of climate than any of the other Atlantic States. In general the climate is of a continental type, and except on Long Island and around New York City the state is subject to sudden changes of temperature. The hottest days in the summer are likely to reach 100° F, while the coldest weather in the winter may bring the thermometer down to 40° F below zero. However, these extremes seldom occur and are of short duration. Throughout the state farmers have to guard against frosts in the early autumn and in the late spring. The summer climate in the Adirondacks and Cat-

skills is delightful. The rainfall averages 41 inches and usually the snowfall is heavy throughout the state.

MINERALS. There are valuable beds of iron ore in the Adirondack region and the average annual production is 1,500,000 tons. The largest brick and tile works in the United States, if not in the world, are along the Hudson River and on Long Island. The annual output of these works is about 12 million dollars. Building stone —granite, limestone, marble and sandstone —is quarried in large quantities. New York is one of the first five states in the production of Portland cement and one of the leading states in the production of salt. Gypsum, fiberous talc, aluminum, graphite, millstones, crude petroleum and natural gas occur in paying quantities. The state has long been widely known for its mineral springs, especially those at Saratoga, which have attained more than a national reputation.

AGRICULTURE. A fertile soil, abundant rainfall and a climate suitable to the growth of any crop that is adapted to a medium, temperate climate make New York a favored agricultural region. More than one-half of the area of the state is under cultivation. In 1920, New York ranked thirteenth among the states in the value of its agricultural products. Most of the farms are small and are in a high state of cultivation. Hay is the most valuable crop, followed by potatoes, which occupy second place. The chief cereal crops in the order of their value are corn, oats, rye, wheat and barley. The western part of the state is adapted to fruit growing and apples, peaches, pears, grapes and small fruits are produced in large quantities.

Dairying is one of the most important branches of agriculture, and New York is only exceeded by Wisconsin in the quantity and value of its production and the number of dairy cows. The dairy region occupies the lake shore section and extends across the central part of the state. Other cattle, horses, sheep and swine are raised in numbers to meet the local demands. Hops are raised in the central part of the state and vegetables are the chief source of income to the farmers located near large cities.

MANUFACTURES. New York is the leading manufacturing state in the Union, excelling both in the value and variety of its products, which include almost everything that is made. Lumber is produced in considerable quantities in the Adirondack region; bricks and tile are manufactured along the Hudson River; and the salt industries are located near and around Syracuse. The manufacture of women's and men's clothing, having its chief center in New York City, constitutes the largest industry. Troy manufactures 90 per cent of the collars and shirts made in the United States. Printing and publishing is the second industry in importance. These are followed by the manufacture of machinery and other machine shop products, the production of textiles, meat packing and the manufacture of flour and other grist mill products. Scores of other commodities are produced within the state. While New York City is the chief manufacturing center, with Buffalo second, manufacturing industries are widely distributed because of the abundance of water power in various parts of the state.

The census of 1920 gave the following data concering manufactures organized under the factory system:

Number of establishments	49,330
Persons engaged in manufacture	1,527,081
Primary horse power	2,639,001
Capital invested	$6,033,828,000
Salaries and wages	$1,885,898,000
Material	$4,947,845,000
Value of products	$8,874,638,000

TRANSPORTATION. The railway facilities of the state are adequate. A number of trunk lines extend from New York City to Buffalo and other ports of the Great Lakes. These lines have branches extending across the central and western parts of the state and all localities are within easy access to one or more railroads. The total mileage is approximately 9,000 which is supplemented by about 5,000 miles of electric lines. The chief railway systems are the New York Central & Hudson River, generally known as the New York Central Lines, the Delaware & Hudson, the Erie, the Lehigh Valley, the Delaware, Lackawanna & Western, New York, Ontario and Western, the Pennsylvania, the New York,

New Haven & Hartford and the Central New England. A number of railroads entering Jersey City have tunnel or ferry connection with New York City.

No other state is so well equipped with waterways as New York. It touches the Atlantic Ocean and Lakes Erie and Ontario and has a number of navigable rivers, of which the Hudson is the most important. The New York State Barge Canal has over 525 miles of canals and 385 miles of canalized rivers. This system includes the Erie Canal, which is the main waterway, and extends across the state from Buffalo to Troy, the Champlain Barge Canal connecting Lake Champlain with the Hudson River, the Oswego Barge Canal, which extends from Oswego, on Lake Ontario, to the Erie Canal, and a number of canals from the south and central part of the state. These canals are owned and operated by the state and since 1903 over $167,124,000 have been spent upon their improvement. They form one of the most important transportation systems in the United States.

Commerce. New York is the leading commercial state and New York City is one of the greatest seaports in the world. Two-thirds of the imports and one-third of the exports of the United States pass through this port. The domestic traffic, or the state's commerce, is also extensive, due to the exchange of commodities between New York City and the rural districts and New York City and other cities. In addition to this the geographic location of New York makes the carrying trade of the state of great importance. Commodities from the Atlantic Coast and New England for the central and western parts of the country, and the surplus products from the Central West destined for the New England states and New York City, all naturally pass through New York.

Population. The census of 1920 gave New York a population of 10,385,227 as compared with 9,113,614 in 1910, a gain of 14 per cent. In 1920 the urban population was 82.7 per cent of the whole, leaving only 17.3 per cent for the rural districts. The average population per square mile, in 1920, was 217.9 as compared with 191.2 in 1910. There were 28 cities having a population over 20,000. The foreign born population in 1920 was 2,786,112. Of this number 545,173 were Italian; 529,240 Russian; 295,650 German; 284,747 Irish. Numerous other countries were represented by numbers from 135,000 English down to as low as 78,374 Hungarians. There was a decrease in the number of foreign born whites over the number of 1910 and this decrease was probably due to the World War and the restriction of immigration which followed.

Education. Public education is under the control of a state board of regents known as the University of the State of New York. The board consists of twelve members elected by the state legislature for twelve years, one retiring each year. This board consists of a president, who has the rank of commissioner of education, and is the executive officer. He is assisted by four assistant commissioners, and the department has charge of all of the public schools, including high schools and other institutions reported throughout the state. The board prepares all examinations for teachers and for promotions from grade to high schools and higher institutions.

New York has no state university, but Cornell University received a land grant from the state which is used in support of the College of Agriculture and Mechanic arts. There are also six agricultural schools supported by the state. A teachers' college is maintained at Albany and there are normal schools at Brockport, Buffalo, Cortland, Fredonia, Geneseo, New Platz, Oneonta, Oswego, Plattsburg and Potsdam. In addition to these there are a number of schools for teachers in Greater New York. The state contains scores of other higher institutions and colleges of learning. The chief of these is Columbia University, which is described under its title. Smith College at Geneva, Vassar College at Poughkeepsie and Wells College at Aurora are all noted colleges for women. The University of New York, while drawing its student body almost entirely from the city of New York, is open to students from the state. Next to Columbia it is the largest institution in the state.

The New York State Museum is the name of a scientific research organization which is the outcome of the natural history survey organized in 1836. It includes the work of the state geologist and his associates, that of the state botanist and his staff, the state zoologist and the archaeologists. These organizations have accumulated a large amount of material illustrating the geological history of the state and other features of its natural resources. This material occupies the fourth floor of the Education Building at Albany and the exhibit is of great value to those who wish to study the resources of the state.

INSTITUTIONS. New York maintains over 500 charitable and penal institutions. These are under the supervision of various boards of charities and correction and lunacy. The state prisons are located at Auburn, Ossining, generally known as Sing Sing, Clinton and Comstock. There is a prison for women at Auburn and reformatories for boys at Elmira and Napanoch; there is a reformatory for girls at Bedford and a training school at Hudson; an industrial school for boys is maintained at Industry, near Rochester.

Hospitals for the insane are located at Buffalo, Binghampton, Islip, Gowanda, King's Park, Middletown, Ogdensburg, Poughkeepsie, Rochester, Utica and Willard. There is an asylum for feeble-minded children at Syracuse and a colony for epileptics at Sonyea; the school for the blind is at Batavia, and a similar institution in New York City also receives pupils from the state; the state hospital for crippled and deformed children is at West Haverstraw and there is a soldiers' and sailors' home at Bath.

GOVERNMENT. The present constitution was adopted in 1894. All attempts to ratify a new constitution since have failed.

The legislative department consists of a senate of 51 members, chosen for two years, and a house of representatives of 152 members, chosen annually. The members of both houses are apportioned by districts but county lines are not broken in forming districts. The legislature meets annually.

The executive department consists of the governor, lieutenant-governor, secretary of state, comptroller, treasurer, attorney-general, state engineer and surveyor, each elected for two years. Many offices and boards are appointed by the governor and confirmed by the senate.

The judicial department consists of a court of appeals, which is the highest court and is composed of a chief justice and six associates elected for fourteen years; below this is a superior court composed of over 100 judges, each elected for fourteen years. This court has four appellate divisions. Lower courts include county courts, surrogate courts, city courts and courts of justices of the peace. Incorporated cities and towns are authorized to establish local courts.

HISTORY. The Hudson River was discovered in 1609 by Henry Hudson, an Englishman employed by the Dutch. The Dutch soon established settlements and temporary trading posts along the river. The first settlement was made on Manhattan Island in 1623 and the second at Albany in 1624. In 1626 the Dutch bought Manhattan Island, now the heart of New York City, from the Indians and named it New Amsterdam. In 1664 the Dutch were forced to deed all their territory, including Delaware and New Jersey as well as New York, to the English, and Charles II granted it to his brother, the Duke of York, and the name was changed to New York. Following this change the colony prospered until it came under the control of unscrupulous governors.

The valley of the Hudson and Lake Champlain was the natural thoroughfare between the Dutch and the English settlements along the Hudson River and the French in Canada. During the French and Indian wars preceding the Revolution, this region suffered severely. Although New York contained many Tories previous to the War for Independence, during that struggle the state stood strongly for the American cause and within its boundaries occurred some of the most important military operations of the war, the chief of these being the surrender of Burgoyne in October 1777. New York was one of the first states to ratify the Articles of Confederation, but it objected to a strong cen-

AIR VIEW OF LOWER MANHATTAN

tral government and was the eleventh state to ratify the Constitution.

At the outbreak of the Civil War and during the early years of this struggle the Democrats, or anti-administration party were in control, but the state strongly supported the Union and furnished over 467,000 troops for the Federal army. Since the Civil War the political status of the state has been uncertain, especially in presidential elections. Sometimes it has been carried by the Democratic party and sometimes by the Republicans. During the World War the state supplied, including the regular army, national army and navy and marine corps, 493,892 men to the American forces, or 10.37 per cent of the total. New York led the states in the number of troops supplied. The total amount of the subscription accruing from Liberty and Victory Loans in New York was $6,944,703,950.

The Iroquois Confederation or Five Nations, as they were known to the English, occupied the Mohawk Valley for more than a century after the discovery of the region by white men, and they took no inconsiderable part in the early history of the colony. The Iroquois were the most intelligent of all the Indians north of Mexico, and their civil and military organizations were far superior to those of any other Indian tribes.

The French incurred their lasting hatred because Champlain and a few of his followers aided their enemies in a battle near the lake which bears his name. Through the French and Indian Wars the Iroquois sided with the English and were strongly influential in securing the victories that deprived France of her territory in America. During the Revolutionary War their sympathies were with the British, but only a few of them took any active part in the struggle.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	47,654
Water area, square miles	1,550
Forest area, acres	12,000,000
Population (1920)	10,385,227
White	10,172,027
Negro	198,483
Indian	5,503
Foreign born	2,786,112
Asiatic	9,214
Chief cities:	
New York	5,620,048
Buffalo	506,508
Rochester	295,750
Syracuse	171,717
Albany	113,344
Yonkers	100,226
Utica	94,156
Schenectady	88,723
Troy	72,013
Binghampton	66,800
Niagara Falls	50,760
Elmira	43,305
Mount Vernon	42,726
Jamestown	38,917
Number of counties	62
Members of state senate	51
Members of house of representatives	150
Salary of governor	$10,000
Representatives in Congress	45
Assessed valuation of property	$25,614,623,746
Bonded indebtedness	$236,024,000
Farm area, acres	20,632,803
Improved land, acres	13,158,781
Corn, bushels	36,708,000
Oats, bushels	24,912,000
Potatoes, bushels	33,990.000
Wheat, bushels	8,747,000
Buckwheat, bushels	4,150,000
Barley, bushels	3,318,000
Beans, bushels	1,072,000
Rye, bushels	806,000
Hay, tons	4,960,000
Hops, pounds	580,000
Manufacturing establishments	49,330
Capital invested	$6,033,828,000
Operatives	1,228,130
Raw material used	$4,947,845,000
Output of manufactures	$8,874,638.000
Miles of railway	8,389
Teachers in public schools	62.598
Pupils enrolled	1,926,931

New York, the metropolis of America and the first seaport and largest incorporated city of the world, is situated in the southeastern part of the State of New York, at the mouth of the Hudson River and on New York Bay. New York leads the world in population, money wealth, foreign and domestic commerce and the value of its manufactures.

POPULATION. In 1920, the population was 5,621,151, or over one-half that of the State of New York. Its population is greater than that of Australia or any of the South American countries except Argentina and Brazil. While the Metropolitan district of London contains over 7,000,000 inhabitants, the population of London proper, or "Registered London," is more than a million less than that of New York. The population of New York has been

gathered from all parts of the earth; only one person out of five may be described as an American. There are more Germans in New York than in Hamburg; more Irish three times over than in Dublin; more Russians than in Nijni-Novgorod; more Italians than in Florence; more English than in the two old Yorks; as many Austrians, Poles, Hungarians and Bohemians as in half of Budapest; Scotts enough for a new Greenoch; Scandinavians enough for a ward in Christiania; half as many Canadians as in Quebec, and more Jews than ever made a living at any one time in Jerusalem.

PLAN OF THE CITY. Previous to 1898, New York did not extend beyond Manhattan Island, which has a length of 13 miles and an average breadth of less than two miles. In 1898, Greater New York, with five boroughs or divisions—Manhattan, Brooklyn, Queens, Bronx and Richmond—became a reality.

Manhattan Island comprises the borough of Manhattan. It is surrounded by New York Bay on the south; North and Hudson rivers on the west, and Harlem River and Harlem Ship Canal and East River on the east. The southern part of Manhattan is the great commercial and financial center of the city; in the middle part are found the leading department stores, theatres, hotels and railway stations; and in the northern part, residences.

The streets at the lower end of Manhattan are very irregular, a legacy from the old village in which the city had its beginning. North of this section, however, the streets are regularly laid out, running north and south and east and west. Those running north and south are called avenues.

The Bronx, a residential district, is north and east of Manhattan. Brooklyn (which see) and Queens are on Long Island. Queens is a select residential district. The borough of Richmond, comprising Staten Island, is chiefly a residential district.

Other islands belonging to the city include Governors Island, used for military purposes; Ellis Island, the gate through which most of the immigrants enter America; Liberty (formerly Bedloe's) Island, bearing the Statue of Liberty, (see LIBERTY ENLIGHTENS THE WORLD); and Coney Island, a pleasure resort south of Brooklyn. All those are in New York Bay. On Blackwell's, Ward's and Randall's islands in East River are located the city's penal and charitable institutions. The area of the city is 327¼ square miles, including 42¼ square miles of water.

FAMOUS STREETS. Wall Street, the financial center of America; Fifth Avenue, the abode of wealth and fashion; and Broadway, the great thoroughfare of the city, are streets of world-wide fame.

Beginning at Battery Park, Broadway extends the entire length of the island, and far beyond the city limits. It passes several small parks or squares and traverses the great commercial ecnter of the city. At 23d Street it crosses Fifth Avenue. At its intersection with Sixth Avenue at 33d Street is one of the busiest sections of the city. In the vicinity are the terminal of the Hudson tubes, the largest department stores and some of the leading hotels. From 43d to 59th Street is the theatrical section, known as the "Great White Way."

Fifth Avenue begins at Washington Square and extends northward to Harlem River, forming the eastern boundary of Central Park. The section from 40th to 59th Street is the most exclusive shopping district in the country, and probably in the world. The northern part of Fifth Avenue is noted for its palatial residences.

Wall Street, extending from Broadway at Trinity Church to the East River, is the center of the financial district, which includes parts of Broad, New and Nassau streets. Within this district are the United States Subtreasury, the Custom House, the Stock Exchange and the large banks.

Riverside Drive, extending along the Hudson from 72d Street to Spuyten Duyvil Creek, is the most beautiful residential street in the city. The Harlem Speedway, extending for two miles along the west bank of the Harlem River, from 155th Street, is for drivers of fast horses.

PARKS AND MONUMENTS. Many small parks or squares serve as breathing places throughout the congested parts of the city.

Madison Square, Union Square and Washington Square are the best known. Riverside Park extends along the Hudson from 72d to 129th Street. Morningside Park extends along Morningside Avenue from 110th to 123d Street.

Central Park, extending from 59th to 110th Street, between Fifth and Eighth avenues, is the best known park in America and one of the most famous in the world. It is two and one-half miles long and one-half mile wide, and has an area of 879 acres of beautiful woodland, meadow, lawn, lakes and ponds, drives, bridle paths and walks. The chief attractions include statuary, monuments, lagoons, playgrounds and a zoological garden. The most interesting manument is the Egyptian obelisk or Cleopatra's needle. It is a single granite stone 69½ feet high and 7 feet 9 inches by 7 feet 8¼ inches at the base. Its weight is 448,000 pounds. This monument was erected before the Temple of the Sun in Heliopolis, Egypt, by Thothmes III., who reigned 1500 B. C. Two hundred years later Rameses II., the Pharaoh of the Bible, carved his name on it. It was presented to the City of New York by Ishmail Pasha and was brought to America at the expense of William H. Vanderbilt. Prospect Park, in Brooklyn, rivals Central Park in beauty, but it is smaller. Bronx Park, in the borough of Bronx, is noted for its botanical and zoological gardens. The wild animals exhibited here are in surroundings as nearly as possible like those in their native homes. Van Cortlandt Park, at the north end of the Broadway subway, and Pelham Bay Park on Long Island, are equipped with golf courses and baseball grounds.

Among the most celebrated statues are the bronze statue of Shakespeare, by J. A. Ward, and the granite statue of Alexander Hamilton, in Central Park; the statue of General Sherman by Saint Gaudens at Fifth Avenue and 59th Street, and the bronze statute of Lafayette in Union Square.

Buildings. The skyscrapers form one of the most impressive and interesting features of the city. The Woolworth building on Broadway, opposite the postoffice, including the tower, has 55 stories, and is the highest office building in the world. From the observation platform at the top an extensive view of the city and its surroundings can be obtained. Other tall buildings of note are the Singer, the Metropolitan Life, the Park Row, the Hudson Terminal and the Consolidated Exchange and the Flatiron building.

The buildings housing the city administration are grouped around and in the vicinity of City Hall Park. They include the new Municipal building, the Hall of Records, the Criminal Courts building and the Tombs, or city prison, connected with the court building by the "Bridge of Sighs." The main postoffice is on Eighth avenue, west of the Pennsylvania railroad station. The Subtreasury on Wall street is one of the most substantial structures in the city. It occupies the site of Federal Hall in which the first session of Congress was held. The colossal Statue of Washington in front of the portico stands where Washington stood when he took the oath of office. Nearby is the Custom House.

Churches. Trinity Church (Protestant Episcopal), facing Broadway at Wall Street, is, perhaps, the most widely known church in the city. In the churchyard are the graves of Alexander Hamilton, Robert Fulton and others famous in American history. The Cathedral of Saint John the Divine (Protestant Episcopal), on Morningside Heights, when completed, will be the largest and the most magnificent cathedral in America. The cost will exceed $10,000,000. The Church of Transfiguration, on 29th Street, near Madison Avenue, and known as "the Little Church Around the Corner," is held in special reverence by actors. Saint Patrick's Cathedral (Roman Catholic), occupying the block on Fifth Avenue, between 50th and 51st streets, is considered the most beautiful church edifice in the New World. Other churches of note are the John Street Methodist, Saint Nicholas Dutch Reformed, the Broadway Tabernacle (Congregational), the Fifth Avenue Baptist, the Fifth Avenue Presbyterian and the Jewish Temple Emanuel.

HOTELS, CLUBS AND THEATERS. New York leads all American cities in the number and costliness of its hotels, clubs and theaters. Most of them are located between Broadway and Fifth Avenue and 30th and 59th Street. Among the first-class hotels are the Waldorf-Astoria, Biltmore, Ritz-Carlton, Knickerbocker, Vanderbilt, McAlpin, Astor and others.

The city has over 200 clubs, representing almost every activity and profession. The best known of these are the Union League, the Army and Navy, the Knickerbocker, the Lambs, the University, the New York Athletic and the New York Yacht.

New York is the theatrical and musical center of the country. There are over 50 standard theaters in the city, besides a large number of vaudeville houses and music halls, and hundreds of moving picture houses. Of all these, the Metropolitan Opera House and the Hippodrome are the most widely known.

LIBRARIES AND MUSEUMS. The Public Library, occupying a beautiful structure of white marble on Fifth Avenue, between 40th and 42d streets, maintains branches over the city, and has extensive reference and reading rooms as well as a circulating department in the main building. The library contains over 2,000,000 volumes besides a rare collection of old books and manuscripts, and is one of the largest libraries in the world. Other important libraries include the Mercantile, at Lafayette Place and 8th Street; and those of Cooper Union and Columbia University.

The Metropolitan Museum of Art, on the east side of Central Park, is the largest and most important museum of art in the country. The magnificent building contains one of the most valuable collections of paintings and statuary in the world. On the west side of the park at 77th Street is the Museum of Natural History, containing one of the most extensive collections of natural history specimens in the United States. The Aquarium in Battery Park, is widely known for its rare collection of salt and fresh water life.

EDUCATION. The public school system is adequate to the needs of the city. The most important among the higher institutions of learning are Columbia University, on Morningside Heights; New York University, in the Bronx; the College of the City of New York for men, Barnard College for Women, and Hunter College for Women. Cooper Union is devoted to training working people.

TRANSPORTATION AND COMMUNICATION. Electric cars traverse a number of north and south streets. These lines are connected by frequent crosstown lines. A complete system of elevated lines extends from the lower end of Manhattan into the Bronx, and an extensive subway system is operated in connection with it. East River is spanned by four great bridges, affording connections with Brooklyn and Queens. Several tunnels under East River provide additional facilities for rapid transit between these boroughs and Manhattan, and tunnels under the Hudson enable electric cars to reach Jersey City and Hoboken. Numerous ferry boats ply on the bay, and the Hudson and East Rivers, connecting Manhattan with Staten Island, and various points on the New Jersey shore and on Long Island.

Numerous railroads connect New York with all parts of the country. The most important lines entering the city are those of the New York Central System and the New York, Hartford & New Haven Railroad, which enter the Grand Central Station at 42d Street between Madison and Lexington avenues; and the Pennsylvania Railroad, which has its terminal at 32d Street, between Seventh and Eighth avenues. These two terminals are the largest, the best equipped and the most beautiful structures of their kind in the world. The trains of the Pennsylvania Railroad enter the city through tunnels under the Hudson River. The railroad also has tunnels under East River so that its trains can run directly to Brooklyn and other Long Island points. All railroads entering the city use electric locomotives. Railroads approaching New York from the west have their terminals in Jersey City and Hoboken. Chief among these lines are the Baltimore & Ohio, the Erie, the Lackawanna, the Philadelphia & Reading, and the Lehigh Valley.

Lines of steamships from all parts of the world, carrying freight and passengers, enter the harbor, and the great transatlantic passenger lines have their American headquarters here. Submarine cables connecting the United States with Europe, wireless telegraph stations and ordinary telegraph and telephone connections give the city communications with all countries.

Industry and Commerce. New York is the largest manufacturing center in the United States and there is scarcely an article used in business or in common life that is not made here. In and about the city there are over 25,000 manufacturing enterprises, furnishing employment to over 500,000 operatives. The manufacture of clothing is the leading industry. New York is also the leading city in printing and publishing.

Under ordinary conditions about one-half of the foreign commerce of the country passes through the port of New York, and the domestic commerce is even greater than the foreign. Docking facilities on the bay and the rivers are ample for handling this volume of traffic.

Government. The mayor and presidents of the boroughs, all of whom are elected for four years, are vested with executive powers. Many officials are appointed by the mayor and may be removed by him. He is also chairman of the board of estimate and apportionment, which has the sole power of granting franchises, and the mayor has a veto power over these grants. The borough presidents preside over local boards and have control of paving, sewers, etc. The board of aldermen consists of 73 members, elected for two years. The city requires the services of 10,000 policemen and over 4,000 firemen.

History. The first settlement was made by the Dutch in 1614, and called New Amsterdam; in 1664, the city passed into the hands of the English and was named New York. British troops held the city from September 15, 1776, to Evacuation Day, November 25, 1783. New York was the capital of the nation during 1789 and 1790. The opening of the Erie Canal in 1825 brought New York in contact with the West and assured its commercial supremacy. Among other important events are the Draft Riot, 1863; the downfall of the Tweed Ring, 1871; the completion of the Brooklyn Bridge, 1883; unveiling of the Statue of Liberty, 1886, and the organization of Greater New York, 1898.

New Zealand, nu zeland, a group of islands in the southern Pacific, 1,200 miles southeast of Australia. The chief islands are North Island and South Island. Both are traversed by elevated mountain ranges. Peaks rise to an altitude of several thousand feet. The loftiest is 9,195 feet high. These islands are about the size of Pennsylvania and New York respectively, and, from all accounts, they have much the same physical features as these states. Mountain, valley, and plain, gorges, rivers, lakes, and cascades are present on a large scale. The entire group occupies an oceanic region 200 miles wide and 1,000 miles in length, extending through eleven degrees of latitude. The highest peaks are snow-capped. The northern shores are in a southern latitude corresponding to that of Savannah, Georgia. The southern end of the group lies in south latitude corresponding to that of northern Maine. The climate found between these extremes of latitude and elevation is more like that of the British Isles, however, than that of the American coast. There is great diversity of soil and scenery. An extensive region—a veritable wonderland of volcanoes and geysers—is a national park.

Minerals, Forests, Etc. The minerals prized by man—iron, gold, silver, lead, zinc, antimony, and magnesium — are all present. About 17,000,000 acres are or were clothed with forests of trees, unknown in the north, but affording excellent timber for fencing, building, railroad ties, and cabinet work. There are almost a thousand flowering plants. Gigantic ferns are numerous. There are 30,000,000 acres suitable for grazing and half that are admirably adapted to the grains and vegetables of Great Britain and the United States.

Animals. The ordinary domestic animals, including poultry, thrive. The native mammals are restricted to two bats and a rat. There are no snakes, few lizards, and but one kind of frog. There are four

species of the wingless bird known as the apteryx or kiwi. Pigeons and parrots abound. English game birds—the pheasant, quails, and partridges—have been introduced. Rabbits, as in Australia, have been introduced and have become a pest. European deer have become perfectly at home. The grasses are said to be so nutritious that deer grow much larger than in England, but cows and horses are smaller.

NATIVE POPULATION. The natives are known as Maoris. Some contend that they are a brown Polynesian race,—they are tall, well built, active; tillers of the soil, skillful canoe men, and fishers. When first known they possessed skill in wood carving, but none in metal work or in the making of pottery. They tattooed their faces and bodies in a striking manner. They were given to tribal wars and were addicted to cannibalism. There are still over 40,000 of them for the greater part settled in a half civilized way, largely through the efforts of missionaries. They adapt themselves to European ways readily, and make a kindly, self-respecting people.

HISTORICAL. The first white man to visit New Zealand was the Dutch captain Tasman for whom Tasmania was named. This was in 1642. In 1769 over a century later, Captain Cook, the next European to see New Zealand, sailed completely around the group and mapped the islands. He left a number of pigs and fowls that multiplied and afforded the Maoris animal food. He also provided seed and taught the natives to raise potatoes, turnips, and cabbages. Missionaries and whalers were followed by traders who sought to exchange beads, guns, and cutlery for timber, flax, and curios.

In 1840 New Zealand was made a British colony. The discovery of gold attracted miners. About $300,000,000 worth of this metal has been taken from the mountains or washed from the sands of the rivers. The wonderful adaptation of the soil to agriculture and grazing attracted settlers in great numbers.

POPULATION. There were, in 1921, 1,218,913 persons, chiefly of British descent, in New Zealand. Half a million of this population had seen no other country. At this date there were fourteen towns with a population of over 10,000. Auckland, the largest, had 157,757, and Wellington 107,488 people. There are over 1,000 Protestant churches, 200 Catholic churches, 1,757 public primary schools, twenty-five high schools, four colleges, two normal schools, five art schools, four schools of mines, a school of agriculture, a school of engineering, numerous private schools, and a state university. There are also over 100 schools for Maori children. The population increases steadily.

COMMERCE. In 1920 the colony exported, chiefly to Great Britain, wool, gold, grain and flour, fresh meats, tallow, hides, leather, feathers, live stock, butter, cheese, hams, bacon, timber, and minor articles to the value of $232,205,000. Fresh meats—5,000,000 carcasses a year—are frozen and shipped in refrigerator ships. Two million dollars worth of kauri gum, used in making varnish, is gathered for export annually. The leading imports are clothing, cutlery, machinery, sugar, tea, tobacco, fruit, oils, bags, paper, and books.

AGRICULTURE. Agriculture and stock raising are the leading industries. There are 85,000 farms and ranches, with room for many more. American reapers are to be seen in the wheat fields. In addition to all the usual field crops and vegetables, apples, plums, and peaches are of excellent quality. The sheep-shearing season begins at the north in September and advances southward with the season, closing in January at the very time when sheep in the northern hemisphere have greatest need of their fleeces. In like manner the harvest begins in December and ceases at the south in February. Rains are frequent and well distributed. Drouths are of rare occurrence. In winter, June to August, the snow line comes down to within 3,000 feet of the sea level. The climate is decidedly oceanic. The mean temperature for summer is about 63° F.; for winter 48° F. As in England, the winter is so mild that barns are not needed. The summers are too cool for Indian corn. Grapes are grown only under glass.

LEGISLATION. New Zealand has been settled by an unusually enterprising, intelligent population. Though on friendly terms with Australia and ready to help the mother country with men and money, the

colony preferred not to enter the Australian Federation. In 1907 the colony was transformed into the Dominion of New Zealand. The country is governed by a local Parliament. Women vote. The Maoris have four members. No government in the world has taken greater pains to guard the interests of individuals and to care for the needy. An effort has been made to give all an equal chance and to prevent poverty. Under no circumstances are public lands to be sold to speculators.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	103,581
Forest area, acres	17,000,000
Population (1921)	1,218,913
Chief Cities:	
Auckland	157,757
Wellington	107,488
Christchurch	105,670
Dunedin	72,255
Wanganui	23,523
Number of provinces	9
Members of senate	41
Members of house of representatives	80
National revenue	$140,000,000
Bonded indebtedness	$1,030,000,000
Farm area, acres	18,044,776
Wheat, bushels	6,872,000
Oats, bushels	5,225,000
Barley, bushels	1,587,000
Corn, bushels	439,000
Wool, pounds	265,083,924
Domestic Animals:	
Horses	334,000
Cattle	3,113,000
Sheep	23,236,000
Swine	342,000
Imports	$305,000,000
Exports	$184,000,000
Manufacturing establishments	4,357
Capital invested	$165,000,000
Operatives	64,951
Output of manufactures	$348,900,000
Gold, ounces	212,973
Silver, ounces	369,400
Tungsten ore, tons	10
Coal, tons	1,843,705
Miles of railway	3,147
Teachers in public schools	6,845
Pupils enrolled	211,155

Ney, nā, **Michel** (1769-1815), a French soldier. He was born in a French village named Saar Louis. He was the son of a soldier who gave him a fairly good education and desired to make him an engineer, but young Ney preferred to enlist in the French Hussars. Ordinarily he might never have risen from the ranks, but amid the upheavals of the Revolutionary War his ability as a soldier was noted by his superiors. He rose rapidly from one position to another until he became Napoleon's most trusted marshal. He commanded in Switzerland, on the Rhine, and in France. Wherever there was a hard fight Ney was sure to be there. He was in nearly all the great battles of the period. It was Ney whom Napoleon called the "Bravest of the brave," and decorated with the grand eagle of the legion of honor, and Ney again whom he made a prince on the field of battle. Ney headed the delegation of French officers who, in the name of the army, requested Napoleon to declare himself emperor. When the empire was declared Napoleon loaded him with honors and dignity. During the disastrous retreat from Moscow Ney brought up the rear and saved what was to be saved of the grand army from destruction. He served at Lützen and at Leipsic, and was faithful to Napoleon to the last. When the emperor was sent to the Isle of Elba, and a Bourbon king, Louis XVIII, was placed on the throne, Ney accepted command of the French army.

When, in 1815, Napoleon landed from Elba and the French soldiers began to desert to his standard by companies and regiments and brigades, Ney went too, and placed himself at the head of his colors at his old emperor's side. He fought the battle of Quatre Bras, and at Waterloo led the last ineffectual charge of the old guard. Napoleon was banished to St. Helena. Ney scorned to flee or to ask for mercy. By order of the degenerate Bourbon prince, he was arrested, tried for treason, and shot in the gardens of Luxembourg. No act of the Bourbon government could have done more to exasperate the feelings of the French people. Ney was buried in the beautiful cemetery of Père Lachaise, where his remains still rest. He was a brave soldier, an able general, and was one of the most heroic figures of the Napoleonic wars.

Nez Perces, nā pẽr-sāz′, pierced noses, a tribe of Indians originally located in Idaho and eastern Oregon. The tribe welcomed and aided Lewis and Clark in their famous expedition in 1804. They requested the whites to send them the white man's

book. It is recorded that for seventy years not a white man lost his life at the hands of a Nez Perce warrior; but, when the whites began to settle up their country, ruin their hunting grounds, and take possession of their fairest lands, the Nez Perces went on the war path under their famous chief Joseph. He and his few hundred followers caused General Miles one of the hardest campaigns he ever undertook; but, of course, the result was inevitable. After a short residence in Indian Territory the old chief and his band were placed upon a reservation near Spokane. Chief Joseph died in 1904, regretted by both the white and red men. General Miles called him the "Napoleon of Indians." See INDIAN.

Niagara River and Falls are in North America. The river flows north from Lake Erie into Lake Ontario. It separates New York on the east from Ontario on the west. It is thirty-six miles in length. It descends 326 feet. The volume of water is almost as great as that of the St. Lawrence, but the current is so swift that the river seems comparatively small.

It leaves Lake Erie at Buffalo, a noble stream half a mile in width. Immediately below the city the river divides into two arms, surrounding Grand Island, a body of land two or three miles wide and several miles in length. Farther down the stream narrows, hurries between small islands, and breaks into rapids, gathering speed for a grand leap. About twenty miles from Lake Erie the water springs over a precipice 165 feet in height and falls into a basin three-fourths of a mile or so in diameter. The current then rushes away down a canyon between steep banks from 200 to 350 feet high. Three miles below the falls the gorge turns almost at a right angle to the eastward. This angle gives rise to a whirlpool. The waters surge and boil as if tossed upward by Titanic forces; they then race along the channel, emerging finally from the gorge and take their way placidly across a low plain into Lake Ontario.

The river is scenic from beginning to end. The chief point of interest, of course, is the falls. The cataract is divided by Goat Island. The American fall is about 1,060 feet in length. The water is from four to ten feet deep. At times, when the winds drive the waters back toward Lake Erie, the American fall runs almost dry. The Canadian, or Horseshoe Fall, has the shape of a crescent or curve about 3,010 feet in length. Its exact depth is unknown. An old boat, weighted with stone until it sank twenty feet into the water, was sent over without grazing the brink. The Canadian fall is by far the more imposing. The water has such a velocity that it shoots far over the ledge, leaving a passage or huge chamber behind it. The fall of water is estimated at 15,000,000 cubic feet per minute. Goat Island may be reached from the American side by a foot bridge. The Cave of the Winds, a recess behind the apron of falling water, is visited by many tourists. There are stairways on both sides of the river leading down to the basin at the foot of the falls. On the American side there is also a short rack and pinion railway or lift. A little steamer, known as "The Maid of the Mist," makes regular trips in the basin. Tourists are provided with rubber clothing. The little steamer holds its way boldly up to the very foot of the falls. When it has reached the nearest point possible, it battles bravely with the boiling water for a few moments, then darts away downward like a swan to a position of comparative quiet. A narrow gauge railway for tourists starts from the brink on the American side, descends into the gorge, and follows the water's edge down past the whirlpool to a boat landing at the mouth of the gorge near Lake Ontario.

Geologically, the gorge and falls are of exceeding interest. The country surrounding the falls is a level, farming region. Strata of limestone rock lie near the surface, with shale and soft stone beneath. The cataract was formerly near Lake Ontario, several miles below its present position. The gorge has been worn away gradually. The soft material underneath has been undermined by falling water, permitting the limestone strata above to fall in. It is said that the gorge is from 5,000 to 7,000 years old. One guess is as good as another. Since 1842 a scientific attempt has been made to note the effects of erosion. During a period of about sixty years the American side of the falls has worn backward seven or eight inches a year. The

NIAGARA FALLS

Palisades of the Hudson River

Looking Up the Hudson River from West Point

Rocky Run

HUDSON RIVER SCENES

Canadian side is wearing faster. It recedes about twenty-six inches a year. During this period, about three-fourths of an acre of rock has fallen on the American side, and about seven acres on the Canadian side. The gorge is now about seven miles in length. At the present rate of erosion, it is only a matter of time, a few thousand, or a few million years, until the gorge will reach and drain Lake Erie.

There are several bridges across the Niagara. There is a fine railroad bridge at Buffalo. Two railway bridges, the steel cantalever bridge of the Michigan Central and the steel arch bridge of the Grand Trunk Railway, cross the gorge a mile and one-half below the falls. A quarter of a mile or so below the falls there is a steel arch traffic bridge which takes the place formerly occupied by a suspension bridge. The main span is 840 feet in length. The roadway is forty-six feet wide and is 192 feet above the water. There is a suspension bridge also at the northern end of the gorge between Lewiston and Queenstown.

The name Niagara is Iroquois, meaning the thunder of the water. Niagara is the most noted cataract in the world. It is visited annually by many thousand sightseers. The state of New York has expended $1,500,000 in purchasing and beautifying the American shore. The Canadian authorities have laid out a public park of nearly 300 acres. Outside of these parks lie the towns of Niagara Falls, New York, and Niagara Falls, Ontario, respectively. There are many hotels and other accommodations for visitors. The total energy of the falls is estimated at 7,500,000 horsepower, equivalent to that developed by the daily consumption of 200,000 tons of coal.

Of late years private companies on both sides of the river have constructed canals and tunnels by means of which a part of the water is used to develop electric power. Electricity is transmitted by wires to the adjacent towns, as well as to Buffalo, where it is used for the purpose of lighting and for manufacturing. There are at the present time electrical power plants having a combined capacity of 500,000 horsepower. The present companies have a gross income of about $10,000,000 a year. It is feared that a desire to make money may result in the withdrawal of so much water as to destroy one of the most sublime spectacles in the world. The amount now withdrawn lowers the water, the users say, two-fifths of one inch. Negotiations have been set on foot between the two governments toward a joint agreement to forbid the further use of the falls for such purposes.

See WELLAND CANAL.

Niagara Falls, N. Y., an industrial city is on the Niagara River and on several railroads, 25 miles north by west of Buffalo. The city, which extends from the Falls of the Niagara to a point three miles below them, is a famous scenic resort, visited by thousands annually. A cantilever bridge and two steel arch bridges span the river at this point, connecting Niagara Falls with the Canadian city of the same name. Power, generated by the Falls, is utilized by manufactories of carborundum, aluminum, paper, flour, electrochemical products, carbon, graphite, electric car heaters, shredded wheat biscuit, carbide and a host of other commodities.

The city contains Niagara University, De Veaux College, a Carnegie library and splendid public schools. On the east of the Falls is a New York state reservation of 107 acres. Before the chartering of the city of Niagara Falls, in 1892, there were two small towns here named Suspension Bridge and Niagara Falls. Population, in 1920, 50,760.

Niagara Falls, Ontario, an industrial city formerly known as Clifton or Suspension Bridge, is on the west bank of the Niagara River, immediately below Niagara Falls. It is 24 miles north-northwest of Buffalo, N. Y., and is served by the Canadian Northern, the Grand Trunk, the Canadian Pacific, Erie, New York Central, Lake Shore, Wabash and other railroads. Three bridges span the river at this point, connecting the Canadian and American cities of Niagara Falls. Power generated by the falls is utilized by manufactories of carborundum, graphite, cereal foods, suspenders, hats, neckwear, hosiery, corsets, paper boxes, carpet sweepers, sanitary cans, chain, wire, hoists and cranes, automobile accessories and other commodities.

A striking feature of the city is the 154 acre Queen Victoria Park, fronting the

river and commanding a fine view of the falls. Niagara Falls has a modern educational system and modern public utilities. In 1921 the population was 14,764.

Nibelungenlied, nē'be-löng-en-lēd, an ancient German epic. It has been called the "Iliad of Germany." The scene is laid on the Rhine. The principal characters are Siegfried, a prince of the Netherlands; Gunther, king of Burgundy; Gunther's sister, Chriemhild; and Brunhild, a heroine of Iceland. Siegfried and Chriemhild, husband and wife, were much attached to each other. Gunther, with the aid of Siegfried, overpowered and married Brunhild much against her will. During the contest Siegfried wore an invisible coat and took from Brunhild a magic girdle and ring in which her power chiefly lay. These he gave to his wife Chriemhild. Ten years later Chriemhild told Brunhild the secret of her defeat. Brunhild, with the assistance of her husband, Gunther, wreaked her vengeance by persuading Hagen, a northern hero, to murder Siegfried. Chriemhild then married Etzel, king of the Huns. Thirteen years later the Burgundians or Nibelungen were invited, with Gunther and Brunhild, their king and queen, to a feast at the court of Chriemhild's second husband. Having become involved in a quarrel with the Huns the whole party was slain with the exception of Gunther and Hagen whom Chriemhild put to death with her own hand. The poem concludes with a general scene of fire and bloodshed. Immense treasure—gold and jewels—was cast into the Rhine near Worms and has never been seen since.

The authorship of the Nibelungenlied is unknown. The legend is not uncommon among the Germans and Scandinavians. It is believed that the poem was pieced together from German sources by an Austrian knight about 1140. It attracted little attention for some centuries. In 1751 it was published by a German named Bodmer. As a source of information relative to the early language, costumes, food, arms, and habits of the Germans, it is now made a subject of serious study in German universities and elsewhere.

Nicaragua, nē-kä-rä'gwä, a republic of Central America. It is about the size of Pennsylvania. It extends from the Caribbean Sea to the Pacific Ocean. It lies within the tropics. The surface is covered for the greater part with low ranges but is crossed by the lowest pass between Alaska and Tierra del Fuego. Lake Nicaragua, a sheet of water 100 miles long, thirty to forty miles wide, and from fifty to 200 feet deep, lies twelve miles from the Pacific coast. Its surface is 110 feet above sea level. It discharges its waters through the San Juan River into the Caribbean. This lake and river form the route of the once proposed Nicaragua interoceanic canal.

A chain of active or dormant volcanoes follows the western coast. In spite of the danger from eruptions the chief cities of the republic are in this region. There are five cities having from 21,000 to 60,000 inhabitants. The cathedral of Leon, the old capital city, is one of the great buildings of Spanish-America. It would cost $20,000,000 if erected today. Thirteen volcanoes may be seen from its roof. Managua, the capital, has 60,342 people.

Nicaragua is rich in mineral and forest resources. Gold, silver, copper, iron, mercury, salt, sulphur, tin, nickel, and zinc are found in greater or less quantities. The forests yield mahogany, rosewood, ebony, cedar, Brazil wood, and other valuable timbers. The natives market vanilla, sarsaparilla, ipecac, wax, balsam, and rhubarb. Plantations of rubber trees, bananas, and coffee yield large returns. The seasons are such that two crops of cotton, three crops of indigo, and four of corn may be raised each year. Tobacco and aguardiente, or spirits, are government monopolies.

Corinto is the chief port on the Pacific coast. Bluefields is the chief port on the eastern shore. It is 1,156 miles from New Orleans. Steamers ply regularly between Nicaraguan ports and Galveston, New Orleans, and Mobile, with cargoes of bananas, coffee, rubber, hides, mahogany, ores, and herbs, and return with miscellaneous cargoes of such merchandise as may find sale in general stores. Crockery, tools, implements, furniture, machinery, clothing, and canned goods are conspicuous. The sales of United States goods to Nicaragua are about $9,000,000 a year. Exports, $8,000,000.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	49,200
Population (1920)	638,119
Chief Cities:	
Managua	60,342
Leon	47,234
Matagalpa	32,271
Granada	21,925
Masaya	17,287
Number of departments	13
Members of senate	13
Members of house of representatives	40
National revenue	$3,385,000
Bonded indebtedness	$4,755,000
Coffee, annual yield, pounds	22,500,000
Cattle	1,200,000
Gold export, value	$925,000
Imports	$10,000,000
Exports	$8,070,049
Miles of railway	171
Number of public schools	375
Pupils enrolled	13,000

Nice, nēs, a French seaport 140 miles from Marseilles. The population in 1921 was found to be 155,839. It is a noted winter resort.

Nice, (nēs), now Isnik an ancient city of Asia Minor. It was long a bulwark against the Arabs, but was captured about 1080.

Nicholas II (1868-1918), emperor of Russia. He succeeded his father, Alexander III, in 1894, and in 1896 was crowned at Moscow. It was hoped on his accession that he would be inclined toward liberalism and adopt many reforms opposed by his father. He did accomplish considerable toward unifying his vast empire but with little thought to the real needs of the common people. The building of the Trans-Siberian Railway was the greatest internal improvement of his reign. This led to aggression in the far east and brought about the Russo-Japanese War from which Russia emerged with scant credit.

Nicholas was responsible for calling the first International Peace Conference in 1899 at The Hague, out of which grew The Hague Tribunal. He is further to be credited with having in 1905 issued a call for the First National Legislative Assembly, the Duma, which had little power.

See DUMA; HAGUE TRIBUNAL; RUSSIA; RUSSO-JAPANESE WAR; TRANS-SIBERIAN RAILWAY; WAR, THE GREAT.

Nicholas Nickleby, a novel by Charles Dickens, published serially 1838-39. It is the story of a youth who is left fatherless, and with mother and sister makes a successful struggle against poverty and the attempt of an uncle to defraud him of his rights. Dickens aimed to expose in this story the cheap boarding schools so common in England at that time.

Nicholos, Saint, a noted bishop of Myra, in Lycia, Asia Minor. His reputed sympathies were certainly broad enough; for he is regarded as the patron saint of the seafaring, of thieves, of virgins, and of children. He is regarded also as the patron saint of the Greek Church. December 6th is celebrated as the festival of Saint Nicholas. See CHRISTMAS.

Nicholson, Meredith (1866-), an American novelist, essayist and poet was born at Crawfordsville, Ind. When only eighteen years old he went into newspaper work, in which he was actively engaged for about fifteen years. Mr. Meredith's novels have won him a large public, and his essays and poems are also popular. Among his novels, the best known are *The House of a Thousand Candles, The Main Chance, The Lords of High Decision, Rosalind at Red Gate, The Port of Missing Men, Lady Larkspur* and *The Proof of the Pudding.* He is the author of a volume of poems entitled *Short Flights,* and of two volumes of essays — *The Provincial American* and *The Man in the Street.*

Nickel, a hard white metal with a slight tinge of yellow. It is capable of a polish like that of steel. Ordinarily it is more brittle than cast iron, but, when mixed slightly with magnesium, it may be hammered into thin sheets. It does not rust in the open air. Nickel is found in meteorites and in ancient rocks in which it is combined principally with arsenic or with arsenic and sulphur. Small quantities are found in the Alleghany, Cascade, and Rocky Mountains, but Lancaster Gap, Pennsylvania, and Sudbury, Ontario, are the only American localities in which nickel is obtained in considerable quantities. Austria, Prussia, and Great Britain produce small quantities. New Caledonia in the Australasian region is a source of large supply. Nickel is worth from fifty to sixty cents a pound. Owing

to a silvery appearance and freedom from tarnish or rust, nickel-plated articles are in demand. Umbrella handles, bicycle handle bars, harness and carriage trimming, watch cases, cheap jewelry, and a long list of ornamental articles are plated with nickel. Nickel enters a number of alloys. Bullets are coated with an alloy of twenty parts of nickel and eighty of copper. An addition of four per cent of nickel gives additional toughness and strength to the steel of armor plates, propeller shafts, piston rods, gun barrels and cannons. German silver contains twenty per cent of nickel. The "nickel" or five cent piece contains one part of nickel to three of copper. A similar alloy is used for small coins, especially in Switzerland and Belgium, Germany and Austria. Nickel is an abbreviation of Kupfernickel, an old German name for the metal, meaning Old Nick's Copper.

Nicollet, Jean, a French explorer. Little is known of him save that he was an agent of Champlain. He was the first recorded white man to set foot on the soil of Wisconsin. In 1834 he ascended the Fox River. He is to be distinguished from the Jean Nicollet who traveled in the West 1832-40. In 1906 a memorial stone to the explorer Nicollet was erected at Menasha, Wisconsin. It marks the site of the ancient fort of the Winnebago Indians. The memorial is a huge boulder of basalt rock, known as Winnebago Manitou stone, or spirit rock. It is mounted on a plain pyramid of sandstone twelve feet high. It is inscribed: "Near this spot landed, 1634, Jean Nicollet, first white man in Wisconsin, met the Winnebago tribe, held earliest white council with 5,000 savages. Erected by the City and Women's Clubs of Menasha, 1906."

Nicollet, Jean Nicolas (1786-1843), a French scientist. He was born in Savoy. He was the friend and pupil of Laplace, who makes frequent mention of him in his *Méchanique Celeste.* He visited the United States in 1833 for scientific study. He desired particularly to explore the Red, Arkansas, Mississippi, and Missouri river basins. He collected ethnological, historical, and physiological data concerning America and its products. He was employed by the war department to make further researches in the far West, and on this expedition he was accompanied by Frémont. He made several geological reports, and a map which was published by order of Congress. He died in Washington, D. C., September 11, 1843. His name is preserved in Nicollet Avenue of Minneapolis, and in Nicollet County, Minnesota.

Nicotine, an alkaloid which is the active principal of tobacco. See TOBACCO.

Niebuhr, nee'boor, **Barthold Georg** (1776-1831), a celebrated German historian. He was born at Copenhagen. He studied at Kiel, London, and Edinburgh. His early manhood was spent in banking. He entered the employ of the Danish government and a few years later was made a director of the government bank. A quarrel with his superior led him to resign office and to leave Copenhagen for Germany. He taught history at Berlin. In 1813 he entered the employment of the Prussian government and took a prominent part in arousing sentiment against Napoleon. In 1823 he settled down as a professor of history at Bonn. His reputation rests on a history of Rome, which he carried down from the earliest times as far as the Punic Wars. It was an epoch-making book. The stories of Romulus and the wolf, the founding of Rome, the vestal virgins, etc., were declared fables. A rational history of the Romans was drawn from such authentic material as was then at hand. Mommsen, whose history of Rome was written at a later date, with fuller material and information at hand, was a pupil of Niebuhr and received his inspiration from him. See MOMMSEN.

Niefelheim. See MYTHOLOGY, SCANDINAVIAN.

Nietzsche, Friedrich (1844-1900), a noted German philosophic writer, a daring thinker and a superb stylist. He was born near Leipsic and was educated at the Universities of Bonn and Leipsic. In 1869 he was appointed professor of classical philology at the University of Basel, but was forced to resign in 1879 by severe eye and nerve strain. Attempts to recover his health failed, and in 1888 he was pronounced incurably insane. He had been friendly with the musician Wagner, but the friendship ended unhappily, Nietzsche pronouncing Wagner's music decadent. It is

said that by this rupture Nietzsche gained philosophical independence, losing his faith in Wagner and in God at the same time. He denounced the Christian faith and the accepted virtues and made his ideal the Superman, the ruthless victor in the struggle for existence. Although Nietzsche's philosophy is not systematic or consistent, the brilliance of his mind, the originality of his thinking, and his daring in running counter to all conventional standards of right and wrong, mark for him a place among the immortals. His subtle, fascinating style and his pithy epigrams are alone sufficient to win him a hearing. He makes the "will to power" his guiding principle, saying that true morality consists in living solely for one's self. His chief works are *The Birth of Tragedy*, *Thus Spake Zarathustra, The Will to Power, The Case of Wagner, Human, All Too Human, The Twilight of the Idols*, *The Antichrist* and *Poems*.

Niger, nī′jer, a river of western Africa. It rises in the southwestern portion of Sudan, about 300 miles from the Atlantic, describes a wide arc to the north and east, and returns to the Atlantic again, discharging an enormous volume of water through several mouths into the Gulf of Guinea. It drains an area of about 575,000 square miles. It is 2,500 miles in length, being the third river in size in Africa. The first European to visit the Niger was Mungo Park in 1796. See TIMBUCTOO; CONGO.

Nigeria, the largest British possession in West Africa, has an area of about 335,700 square miles and a population approximating 17,000,000. The colony lies on the Gulf of Guinea, between French Dahomey and Cameroon, and extends inland about 600 miles, or to French West Africa.

Nigeria, like most of Africa, is rich in as yet almost undeveloped natural resources, mineral and agricultural. A large area in the interior is densely forested with valuable timber, and mahogany production is becoming important. The Niger River flows down from the interior through the center of the southern half of the territory, and this and other rivers are the principal transportation routes.

The chief products of Nigeria are palm oil and palm kernels, ivory, ostrich feathers, rubber, ground nuts, kola nuts, a variety of drugs, cocoa, cotton, coffee, live stock and hides. Deposits of tin, iron, lead, coal and silver are worked. The articles enumerated above are the items of a considerable export trade. There were 1,126 miles of railway in the colony in 1920.

Nigeria was created from a number of separated but very similar small territories, and these were formed into the upper and lower Nigeria protectorates in 1900. The territory is administered by a governor holding appointment from the crown. Slavery has been suppressed in Nigeria, the slave traffic has been abolished, and much time and money is expended annually to make of the natives an intelligent body of self respecting, self supporting people.

Night, that portion of time during which the sun is below the horizon, from sunset to sunrise.

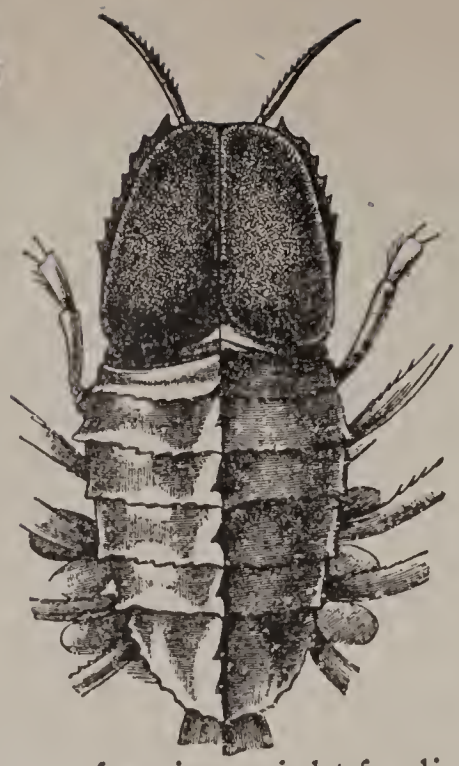
> God saw the light was good;
> And light from darkness by the hemisphere
> Divided: light the day, and darkness night
> He named,

says Milton. As a matter of fact, day is an ambiguous term. It covers the time from sunrise to sunset or from midnight to midnight indifferently, but night is restricted to the period of darkness. At every moment one-half of the world has nights. The nights are twelve hours long on the equator. See DAY.

Nighthawk, a bird closely related to the whip-poor-will and often confounded with it. The nighthawk, bull-bat, or night-jar, as it is called, is a trifle larger than the whip-poor-will. It has darker plumage, with a broader white band on the breast and a conspicuous white bar on the shortest wing coverts.

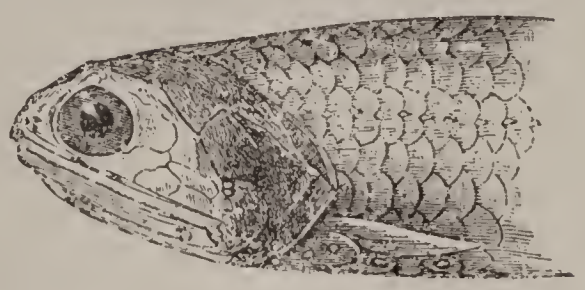
Nightingale, a small, reddish-brown, thrush-like bird of the Old World, celebrated for the sweetness of its song. In England it is a modest, shy bird, haunting rich woods and thickets. It lives chiefly on insects, especially the larvae of ants. Like most insect-eating song birds, it is migratory, ranging from northern Europe to northern Africa. It appears in England in April but

Head of moth (Attacus).



Eyes and antennae of various night feeding insects.

Head of Italian lizard, the wall gecko.



Wide-mouthed sea salmon

Flying frog.

Screech owl.

Hawk owl.

Spectral lemur.

Egyptian jumping mouse.

Night-lemur.

EYES OF NOCTURNAL ANIMALS.

does not visit Wales, Ireland, or Scotland. The nest is built of grass and leaves, preferably near running water. The eggs, four to five in number, are olive green in color. The male is the singer. While the female is nesting, especially in the evening, he soars aloft pouring out a rich burden of song, as if too happy to contain his secret. When the young are hatched, he stops singing and busies himself hunting insects to fill open mouths. The male is a favorite cage bird. The nightingale is celebrated in literature. It is the Philomela of the poets. The name has been extended to a number of somewhat similar birds, including the bulbul of the Orient and one or more finches of our Southern States. See PHILOMELA.

Nightingale, Florence (1820-1910), an English philanthropist. She was born in Florence, Italy, of wealthy English parents. Miss Nightingale took a deep interest in suffering humanity, and trained herself in the details of hospital management. During the Crimean War she was sent by the British government with a band of thirty-eight trained nurses to relieve the sick and the wounded on the battlefield. Her work was so eminently successful and called forth so many testimonials of esteem and confidence from grateful soldiers that, on her return, the British public raised $250,000 by subscription and presented it as a recognition of her services. Miss Nightingale used the money to found a training school for nurses. See RED CROSS SOCIETY.

Night School. See SCHOOL.

Nightshade, the common name of several plants. The botanical name is *Solanum*. The ground cherry, potato, and tomato belong to the nightshade family. The common or black nightshade has an erect, angular stem, with spreading leaves and drooping umbels of white flowers. The fruit is a globose black berry. It has been introduced into this country from Europe. It is a common weed in waste places. It has the reputation of being poisonous; yet the berries and leaves are eaten by animals without apparent injury. The leaves are boiled by many people for greens. The drug known as belladonna is extracted from an allied species, called "the deadly nightshade."

Nihilists, a secret society of Russia. It is composed of radicals grown desperate. The object of the order is to overthrow despotism by a policy of terrorism. The membership includes people of all occupations—soldiers, sailors, clergymen, workingmen, engineers, and students. During the period from 1860 to 1878 a large number of university students betook themselves to trades in order to come into contact with workmen so as to give them new ideas. These enthusiastic men were hunted down by the police and sent to Siberia. Over 200 persons of education and culture were sent to labor in the mines. In despair of accomplishing a peaceful revolution in Russia by rational means the more determined leaders organized the Nihilist Society. Its principal purpose, under the old régime, was the assassination of Russian officials. Bombs were relied upon chiefly. It was the aim of the leaders to terrify the rulers of Russia into the adoption of a more liberal form of government. To this end every effort was made to cause the czar, obnoxious generals, prominent police officials and others to feel that their lives were in danger if they appeared on the street or took a journey. Some of the more prominent assassinations may be mentioned. In 1878, General Mesentzoff; in the following year, Prince Kropotkin met his fate. In March, 1881, the czar himself, Alexander II, was assassinated. During the Russo-Japanese War the Nihilists again became very active, and in 1905 the governor of Finland was killed by a bomb. The action of Czar Nicholas II in inaugurating constitutional government by authorizing the election of the Duma went far to remove the cause of Nihilism, and the overthrow of absolutism in 1917 went farther. There is now no body that corresponds to the Nihilists. See DUMA.

Nijni-Novgorod, nĭj′nĕ-nŏv-gō′rŏd, a famous city of eastern Russia. It is situated at the junction of the Oka and the Volga. It is the capital of the province of the same name. Nijni means lower. It is an adjective used by way of distinction from the province and city of Novgorod, near St. Petersburg. The city fronts the Volga, just below the mouth of the Oka. A central eminence, surrounded by an extensive wall

with eleven towers, is known as the Kremlin or ancient citadel. Within the inclosure are situated the cathedrals, the governor's residence, the arsenal, barracks, and other public buildings. The river frontage is occupied by numerous buildings, timber wharves, etc.

The city is noted for an annual fair, removed hither from the ancient city of Makarieff in 1816. It is held on a flat, sandy tongue of land, between the Oka and the Volga. It is reached from the city proper by a fine bridge of boats. The fair grounds contain over three thousand stone booths built in regular rows. They are surrounded by a canal connected with the Oka. The regular population of the city is about 100,000. There are about 300,000 in attendance during fair time. Traders are present from China, India, Persia, Afghanistan, Arabia, Turkey, and the confines of Russia. Enormous quantities of cotton, woolen, linen, and silk goods change hands. Iron wares, pottery, salt, corn, fish, wine—all sorts of manufactured goods—are offered for sale. Chests of tea from China are opened and tested. Precious metals, iron and iron ware, come from the Ural Mountains. The grain from the Oka valley changes hands at this fair. The main fair, called the Peter-Paul fair, is held from August 5th to September 15th. At this season the river is thronged with thousands of boats. The wharves are piled up for ten miles with bundles of merchandise. The whole city goes wild with excitement. Amusements of all sorts are at their highest. Subordinate fairs are held here. One for trade in timber and woodenware is held in winter on the ice of the Oka. Another is held in July for the trade in horses.

Nile, nīl, a river of Africa. It is the largest river in Africa. It is one of the most noted rivers in the world. The ancients knew in a general way that the Nile came from equatorial Africa, but, further than this, the source was a mystery. The headwaters are now known to be collected by Victoria Nyanza. Nyanza is an African word meaning "lake." Lake Victoria, as it is sometimes called, is second only to Lake Superior in size, and lies at an altitude of about 4,000 feet above the sea. It was discovered by Speke in 1858 and was explored later by Grant and Stanley. It contains islands of considerable size and is navigated by steamboats. A railroad leads eastward to the coast of the Indian Ocean.

As the Nile issues from the northern shore of the lake it drops over a ledge of rocks about twelve feet in height. It is 400 to 500 feet in width and is divided by wooded islets into a number of channels. It races through a rocky pass northwestward toward Albert Nyanza. About twenty miles above the latter lake the Nile "rages furiously through a rock-bound pass and plunges at one leap of about 120 feet into a gloomy abyss." This cataract is known as Murchison Falls. Albert Nyanza is about as large as Great Salt Lake. It is practically an expansion of the Nile. From this lake the Nile continues northward. In places its course is smooth, and the river widens out into island-studded reaches. In other places it contracts, rushes through gorges, and shoots rapids. Again there are stretches of sluggish waters adorned with white, blue, and crimson water lilies and visited by a multitude of waterfowl. Reeds rivaling the bamboos of the East and the canebrakes of Kentucky rise like a wall to a height of twenty or thirty feet along the channel. Myriads of insects hover in the air. At Khartum the White Nile, as the main stream is called, receives the Blue Nile from the Abyssinian Mountains. During the next 500 miles it tumbles over several cataracts, then stretches away northward under ancient Karnak and Thebes, past the pyramids and Memphis, to Cairo and the Mediterranean Sea.

The total length of the Nile, windings included, is about 4,000 miles. The area of its basin is 1,082,000 square miles. It extends through thirty-five degrees of latitude. It is about 2,450 miles in a straight line from Victoria Nyanza to the delta of the Nile. The headwaters of the White Nile lie in a region of abundant and regular rains. The delta of the Nile has an annual rainfall of between one and two inches. Through the greater part of its course, however, the Nile runs through a region practically without rain. It loses so much water from evaporation that, at ordinary seasons of the year, it grows smaller as it advances

northward. Once a year the Blue Nile brings down water from the melting snows of Abyssinia. The Nile begins to rise in June, reaches its greatest height in about three months, then subsides again. At the season of flood large areas are inundated and enriched with mud from the mountains of Abyssinia. In ordinary years the rise at Cairo is about twenty-five feet.

The fertility of Egypt is due entirely to the Nile. The ancients worshiped the river Nilus as a god. A temple was dedicated to him at Nileopolis, and festivals were held in his honor. In the art of the Greeks and Romans Nilus was represented as a river god reclining at ease and surrounded by sixteen children. The latter was supposed to be symbolical of the customary height in cubits to which the river rose at flood.

Although conferring unsurpassed fertility the favors of the Nile are by no means uniform. In some seasons there is insufficient water to reach outlying lands, and a part of the population of Egypt is brought to the verge of starvation. In other years the volume of water is so great that improvements are swept away and great loss is incurred. Efforts have been made for centuries to remedy the matter. Extensive canals have been dug. In time of sluggish water they are likely to fill up with silt. In time of flood they are apt to become raging torrents. A swift current eats away the banks, and fertile plains and villages are swept away.

In 1850-65 a dam or barrage, as it is called, was constructed across the Rosetta and the Damietta arms at the apex of the delta. This work may be described as a brick viaduct, consisting of 132 arches of sixteen feet four inches span. These archways were provided with gates which might be closed. This barrage is capable of raising the water fifteen feet, affording irrigation for the delta in time of need. This work was constructed by French engineers and cost about $2,500,000. A second barrage crosses the Nile at Assiout, about 250 miles above Cairo. It also cost $2,500,000.

The third great work was undertaken in 1898 at Assouan, ancient Syene, at the foot of the first cataract, 650 miles above Cairo. One of the greatest dams ever constructed has been built here. It is one and one-fourth miles in length. In crossing the river advantage is taken of four small islands. This dam is 130 feet in height. It contains 1,000,000 tons of masonry. The material was quarried in the immediate vicinity. It is the Syene stone used by the Egyptians for their obelisks and in the construction of many of their great works. The foundation of the dam is composed of huge blocks of this granite set in Portland cement. As high as 11,000 men, including 1,000 European mechanics, were employed. There are 180 sluices, from twelve to twenty-three feet high by six and one-half feet wide. They are closed by gates sliding on rollers. Navigation is provided for by a series of four locks. Seen from a height, the locks look like a huge ladder of masonry lying in the water near the western shore. When the sluices are closed, the water is raised to a height of seventy-five feet. Two hundred and fifty billion gallons of water are stored up for use in time of need. It is expected that the locks will bring large additional areas of land under cultivation and that the enormous expense of their construction, both principal and interest, will be met by rent collected for the use of fields not now in existence. Increased acreage and greater freedom from drouth and flood are expected to add $12,000,000 a year to the national wealth. The yield of the long, staple cotton for which Egypt is famous will be increased a fourth.

The upper Nile is obstructed by matted vegetable growth known locally as sudd. The chief growths in the sudd are papyrus and elephant grass, the latter a kind of bamboo that grows to a height of twenty feet. These are knit together by a creeping convolvulus or plant of the morning glory type. Other parts of the sudd are dominated by a long sword grass that cuts like a knife, known as "oom soof."

Nilsson, Christine (1843-1921), one of the most noted singers of her day, was born at Wedersloff, near Wexio, Sweden. Her father was a poor laborer and the first fourteen years of her life were filled with hardship, but during this time she learned to play the violin and flute and developed a remarkable voice by her own efforts.

already left the bow of Apollo. He, too, fell slain. Even then the spirit of Niobe was unbroken. In the midst of her anguish she boasted of her seven daughters of unsurpassed beauty and grace, saying that sons-in-law would take the place of her sons. Again the arrows of Apollo sped. The daughters fell one after another, even around the biers of their dead brothers. While the unhappy mother clasped the youngest, the last of her children, to her heart, the child died transfixed by a fatal shaft. Niobe, in excess of grief, was turned into stone. A whirlwind wafted her away to her native mountain, where she may still be seen a mass of stone, from which a trickling fountain flows. The Niobe group is the subject of a piece of beautiful Grecian sculpture in the Uffizi gallery at Florence. In describing Rome, once mistress of the world, Byron has used the legend of Niobe beautifully:

The Niobe of nations, there she stands,
Childless and crownless in her voiceless woe.

Nipigon or **Nepigon**, a lake in the Nipigon Forest Reserve, province of Ontario, is 35 miles north of Lake Superior and 75 miles northeast of Port Arthur. The lake is about 60 miles long from north to south, and about 45 miles wide, but its sinuous shores have a total length of 580 miles. Lake Nipigon is 813 feet higher than Lake Superior; it is fed by a number of mountain streams, and empties into Lake Superior via the Nipigon River. The lake is dotted with small, bleak islands, and is well stocked with fish.

Nipissing, Lake, is in the province of Ontario and lies midway between the Ottawa River, on the east, and Georgian Bay, on the west. The lake is 55 miles long from east to west, and 28 miles at the widest point from north to south. The lake is fed from the north through Sturgeon River, and discharges into Georgian Bay through French River. There is steamer service on Nipissing during the summer months, and the lake may be reached by the Grand Trunk, Canadian Northern and Canadian Pacific railroads. On some future day the lake may be utilized to form a part of the Ottawa-Georgian Bay Ship Canal.

Nirvana, nĭr-vä′na, in Buddhist philosophy, the ultimate state or condition into which the soul enters after it has been perfected by the long processes of metempsychosis or transmigration. Karma is the active earthly life of struggle, and may continue for thousands of years, but at the end of Karma is "Nirvana the Blest." The word Nirvana means a blowing out, and the Buddhist conception seems to be of a condition equivalent to extinction. It is "freedom from the pang of earthly existence."

Nitric Acid. See NITROGEN.

Nitrogen, an element existing in nature as a colorless, odorless, tasteless gas. It is reducible toa liquid under extreme pressure and cold. Its specific gravity is .9674. It is neither combustible nor a supporter of combustion, nor does it enter readily into combination with any other element. At a high temperature it unites directly with magnesium, silicon, chromium, and other metals.

Nitrogen forms about 77 per cent of the weight of the earth's atmosphere, and is a necessary constituent of all animal and vegetable tissues. In combination with hydrogen it forms the strong base ammonium, and with hydrogen and oxygen a series of acids of which nitric acid is commercially the most important. It may be most readily prepared from atmospheric air. There are only five known compounds of nitrogen and oxygen, including nitrous oxide and nitric oxide. Nitrogenized foods, so called by dietitians, are nutritive substances that contain nitrogen, principally proteids; non-nitrogenized foods are principally carbohydrates and fats. See ALBUMINS; PROTEINS.

Nitric acid may be prepared by distilling a mixture of sulphuric acid and sodium nitrate. When pure it is a colorless liquid, but it is usually yellowish, owing to a small admixture of oxides of nitrogen. Its smell is very strong and disagreeable, and it is intensely acrid. Applied to the skin, it cauterizes and destroys it. It is a powerful oxidizing agent, and acts with great energy on most combustible substances, simple or compound, and upon most of the metals. It exists in combination with the bases potash, soda, lime, and magnesia, in both the vegetable and the mineral king-

doms. It is employed in etching on steel or copper; as a solvent of tin to form with that metal a mordant for some of the finest dyes; in metallurgy and assaying; in the manufacture of the most powerful explosives; also in medicine, in a diluted state, as a tonic, and in affections of the alimentary tract and of the liver; and in concentrated form as a caustic. In the arts it is known as aquafortis, and is sometimes called azotic acid, nitrogen having formerly been called "azote."

Nitrogelatin is an important explosive, compounded principally of guncotton and nitroglycerin. It has no relation in chemical composition to gelatin, the name having reference merely to its jelly like consistence. Its value depends in large measure upon the fact that of its two principal components, the one, guncotton, contains an insufficient proportion of oxygen for complete combustion, while the other, nitroglycerin, contains an excess of the same element; by blending proper quantities of the two, complete oxidation of the carbon and hydrogen is effected, with consequent maximum evolution of explosive energy.

Fixation. Fixation of the free nitrogen of the air is accomplished both naturally, by plants, and artificially, by man, for commercial use. The roots of certain plants serve as hosts to microbes which perform the function of fixing and accumulating in the soil the nitrogen which plants require for their life and growth. The microbes operate by means of tubercles formed through their agency on the roots. Such plants are known as nitrogen-fixing plants. The fixation of atmospheric nitrogen is now accomplished by man on an industrial scale, and the useful nitrates are produced, as a result of experiments in which moist atmospheric air was acted upon by high-tension electrical discharges in the presence of basic materials. The nitrates are, chemically, salts of nitric acid, generally soluble in water and easily decomposed by heat. They are important as oxidizing agents and sodium nitrate is one of the leading fertilizers employed in agriculture.

It is estimated that over each acre of ground there are some 39,000 tons of atmospheric nitrogen, or in other words, 80 per cent of the fifteen pounds pressure of the air upon every square inch of surface is due to the valuable nitrogen. Only in comparatively recent years has this atmospheric nitrogen been fixed for commercial use. Germany was successful in this direction prior to starting the World War, but fixation of nitrogen from the air has since been carried out in the United States on a large scale. It is said that in 1918 a single plant in Germany took about 100,000 tons of nitrogen, from the air, this being an amount equivalent to one-fifth of the annual output in Chile, which furnished most of the natural nitrates to the world.

Chemical fixation of nitrogen is accomplished by the use of a powerful electric arc. The action of nature in a thunderstorm is imitated, and thus the nitrogen and oxygen of the air are caused to combine to form nitrogen peroxide. When treated with water this forms nitric and nitrous acids, and further treatment changes these acids to calcium salts or lime niter.

As it is one of the farmer's chief problems to keep up the necessary supply of nitrogen in the soil, the use of nitrates is his greatest resource. The saltpetre fields of Chile have hitherto furnished an immense supply. The United States imported $28,000,000 worth in a recent year, and 3,600,000 tons of nitrates passed through the Panama Canal during the fifteen months prior to the Armistice. But Chilean nitrates are expensive, and there is a limit to the supply. It will therefore be seen that the discovery of chemical methods of fixation of nitrogen was of immense value to the world. Where water power is available, nitrogen can now be cheaply produced from the air, by the use of electricity, as described, and the Germans have another method, called the Haber process, in which the elements used are nitrogen and hydrogen and the result is ammonia. In this process the agent employed is not the gigantic electric arc, but some rare metal, such as platinum, uranium, or osmium, which acts mysteriously by the decomposition and new combination of the elements. When the ammonia is produced, it is subjected to a further process to change it into

the form of nitric acid. Besides nitrogen, other useful elements are now trapped from the air by the chemist, including argon and neon, which are used in incandescent electric lamps.

The cyanimide process, which forms a great German industry, consists in heating calcium carbide with nitrogen in the electric furnace. The nitrogen is obtained from liquid air by boiling off the oxygen, or as residue from water gas or producer gas which has been used in the manufacture of hydrogen. The cyanimide is applied to land directly as a fertilizer, and on exposure to water at an ordinary temperature slowly evolves ammonia, which under the action of nitrifying bacteria is converted into compounds of nitrogen that are readily absorbed by growing plants. It may be noted also that ammonia is easily formed by heating calcium cyanimide with water under pressure.

NITRIDES, such as those of magnesium, boron, and silicon, are prepared in the electric furnace, and are useful as fertilizers rich in nitrogen, and as sources of ammonia, though their cost of production is rather high. Many other processes have been used in recent years for the fixation of nitrogen, in both Europe and America; and it is asserted that if Germany had not solved the problem before the war, she could not have maintained for so long the supply of explosives to her army.

See AMMONIA; CLOVER; ALDER; LEGUME; NITROGLYCERIN; SALTPETER; GUNPOWDER; PHOTOGRAPHY; ETCHING.

Nitroglycerin, nī-tro-glĭs′ẽr-ĭn, a powerful explosive agent. It is a light yellow, oily liquid produced by the action of nitric acid and sulphuric acid on glycerin. It is 1.6 times as heavy as water. When struck a quick, hard blow, or heated rapidly to 306° F. it explodes with terrific violence. It is a poison, but may be administered in minute doses as a remedy for heart failure. It was discovered in 1864. Pound for pound, it has about three and one-half times the force of powder, but it acts so quickly that it is more effective than powder in blasting large masses of rock. Nitroglycerin is too dangerous for ordinary use. See DYNAMITE.

Nitti, Francesco Saverio (1868-), an Italian statesman and lawyer born at Melfi. He was professor of financial science at the University of Naples, and then in 1904 entered Parliament. At different times he was Minister of Industry, Agriculture, and Trade. In the Orlando Cabinet he became Minister of the Treasury, and then on the fall of Orlando he became the next premier. However, his administration was a weak one, the Socialists and Communists were permitted innumerable transgressions, and he was succeeded in June, 1920 by the returned Giolitti.

Nivelle, Robert George (1856-), a French general born at Tulle and educated at St. Cyr and the École Polytechnique. From the rank of lieutenant he was promoted to a captaincy in 1880. In 1901 he became a major, serving on the Chinese Expeditionary Corps, and in 1911 he was made a colonel, and acted as chief of staff with the Algiers Division.

His first distinction during the World War came on Sept. 6th, 1914 with the 7th corps, when he was specially mentioned in connection with the excellent work of the corps, and Dec. 12th, 1916 he was made commander-in-chief of the armies of the North and North East.

However, as soon as he received this important post, he is said to have assumed an air very offensive to the authorities. It was after his maneuver of April 16, 1917, which has been referred to as being halfway between a success and a failure, that he was dismissed.

Noah, in Old Testament narrative the one man who "found favor in the eyes of Jehovah," at the time when He determined to destroy all living creatures from the face of the earth because the "wickedness of man was great."

Noah was the son of Lamech and the grandson of Methuselah. When he was 500 years old three sons were born to him, Shem, Ham, and Japheth. Under the directions of Jehovah, Noah built the ark of "gopher wood" and in it he and his sons and their families, and two of every sort of living thing, "of the birds after their kind, and of the cattle after their kind, and of every creeping thing of the

ground after its kind," lived in safety, while "the fountains of the great deep were broken up, and the windows of heaven were opened, and rain was upon the earth forty days and forty nights." Only Noah and they that were with him in the ark were saved alive. "Every living thing was destroyed that was upon the face of the ground." After a hundred and fifty days the waters decreased and the ark rested upon Mount Ararat. Then Noah opened a window and sent forth a raven, which did not return; again, he sent forth a dove, but the dove came back finding "no rest for the sole of her foot." After seven days Noah sent forth the dove a second time and she brought back to him an "olive leaf plucked off," and after "yet another seven days he sent forth the dove and she returned not again unto him any more."

Then Jehovah made a covenant with Noah and with his three sons, and set the rainbow in the clouds as a token that "while the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease."

After the flood Noah lived 350 years, dying at the age of 950, and by the descendants of his three sons "was the whole earth overspread." This statement is the foundation of the belief that the Aryan races descended from Japheth; the Semitic, from Shem; and the Hamitic, from Ham.

Nobel, Alfred Bernard (1833-1896), a Swedish inventor, the inventor of dynamite, the founder of the Nobel Prizes. He was born at Stockholm October 21, 1833, and died at San Remo, Italy, December 10, 1896. At the age of seventeen he was sent to the United States to receive an engineer's training under his famous countryman, John Ericsson, the designer of the Monitor. His father, an inventive man, having moved to St. Petersburg, young Nobel joined him there in 1854. He continued his studies, making himself a master of modern languages and chemistry. He was employed by the Russian government in the preparation of mines and torpedoes, and became superintendent of an explosive and firearms factory on an island in the Neva.

Nobel was now a famous man. He enlarged his factories in Sweden and Germany and built new ones in Scotland and near San Francisco. Nobel was a natural inventor, rivaling even Edison.

At death Nobel left a fund of $9,000,000, the interest on which he directed should be distributed annually in five prizes to the persons who should distinguish themselves as follows:

1 and 2. For the most important discoveries in physics and chemistry. These prizes are to be awarded by the Royal Academy of Science at Stockholm.

3. For the most important discovery in medicine. This prize to be awarded by the Caroline Medical Institute of Stockholm.

4. For the most important work in realistic literature. Awarded by the Swedish Academy, Stockholm.

5. For the most distinguished advocate of peace measures. Efforts tending to diminish standing armies, to establish peace congresses, to promote arbitration, or to make treaties of peace are included. This prize is awarded by the Norwegian Storthing or popular legislative body.

No one is permitted to apply for a prize. The awards are hononary, made wholly on the recommendation of eminent scholars or learned societies. The income from the fund permits prizes of $50,000 each. The first was made in 1901. Among the prizes of that and succeeding years were awards to Konrad Röntgen of Munich for the discovery of Röntgen rays; Emil von Behring, for diptheria serum; Sully-Prudhomme of Paris, author of *Justice;* Mommsen of Berlin, the historian and author of works on Latin inscriptions on tombs and monuments; Ronald Ross of Liverpool, for the discovery that malaria germs are implanted my mosquitoes; and to Frederick Maartens, for promoting the Hague Conference. The latter, it may be remembered, took a prominent part in drafting the treaty of 1905 between Japan and Russia. He preferred that the prize should run in the name of the Institute of International Law. Theodore Roosevelt was awarded the peace prize

in 1906, and Woodrow Wilson in 1920. The other prizes awarded up to 1922 are:

PHYSICS.

Name	Year	Nationality
Wilhelm Konrad Röntgen	1901	German
H. A. Lorentz	1902	Dutch
P. Zeeman	1902	
Henri Becquerel	1903	French
Pierre Curie	1903	French
Madame Sklodowska Curie	1903	Polish
Lord Rayleigh	1904	English
Philipp von Lenard	1905	German
Joseph J. Thomson	1906	English
Albert A. Michelson	1907	American
Gabriel Lippman	1908	French
William Marconi	1909	Italian
Ferdinand Braun	1909	German
Johannes D . Van der Waals	1910	Dutch
Wilhelm Wein	1911	German
Gustaf Dalen	1912	Swiss
H. Kamerlingh Onnes	1913	German
Prof. Max von Laue	1914	German
Prof. William H. Bragg	1915	English
W. L. Bragg	1915	English
Prof. C. G. Barkla	1917	English
Prof. Max Planck	1918	German
Prof. Hermann Starke	1919	German
C. E. Guillaume	1920	Swiss
C. G. Breteuil	1920	French
Dr. Albert Einstein	1921	German
Prof. Nils Bohr	1922	Danish

CHEMISTRY.

Name	Year	Nationality
Jakobus H. Van't Hoff	1901	Dutch
Emil Fischer	1902	German
Svante Arrhenius	1903	Swedish
Sir William Ramsay	1904	English
Adoph von Baeyer	1905	German
Henri Moissan	1906	French
Edward Büchner	1907	German
Ernest Rutherford	1908	English
Wilhelm Ostwald	1909	German
Otto Wallach	1910	German
Madame Marie Curie	1911	Polish
Professor Griggnard	1912	French
Paul Sabbatier	1912	French
Alfred Werner	1913	Swiss
Prof. T. W. Richards	1914	American
Dr. R. Willstaetter	1915	German
Prof. Fritz Haber	1918	German
Walter Nernst	1920	German
Prof. Frederick Soddy	1921	English
Francis W. Aston	1922	English

MEDICINE.

Emil Behring	1901	German
Ronald Ross	1902	English
Niels R. Finsen	1903	Danish
Ivan Petrovitch Pavlov	1904	Russian
Robert Koch	1905	German
Camille Golgi	1906	Italian
Santiago Roman y Cajal	1906	Spanish
Charles Alphonse Laveran	1907	French
Paul Ehrlich	1908	German
Elie Metchnikoff	1908	Russian
Theodor Kocher	1909	Swiss
Albrech Kossel	1910	German
Alivar Gullstrand	1911	Swedish
Alexis Carrel	1912	French
Charles Richet	1913	French
Dr. Robert Barany	1914	Austrian
Dr. Jules Bordet	1919	Belgian
Prof. August Krogh	1920	Danish

LITERATURE.

Armand Sully-Prudhomme	1901	French
Theodor Mommsen	1902	German
Björnstperne Björnson	1903	Norwegian
Frédric Mistral	1904	French
José Echegaray	1904	Spanish
Henry Sienkiewicz	1905	Polish
Giosué Carducci	1906	Italian
Rudyard Kipling	1907	English
Rudolph Eucken	1908	German
Selma Lagerlof	1909	Swedish
Paul Johann Ludwig Heyse	1910	German
Maurice Maeterlinck	1911	Belgian
Gerhard Hauptmann	1912	German
Rabindranath Tagore	1913	Bengalese
Romain Rolland	1915	French
Verner Heidenstam	1916	Swedish
Karl Gjellerup	1917	Danish
M. Pontoppidan	1917	Danish
Knut Hamsun	1920	Norwegian
Anatole France	1921	French
Jacinto Benavente	1922	Spanish

PEACE.

Henri Dunant	1901	Swiss
Frédéric Passy	1901	French
Elie Ducommun	1902	Swiss
Albert Gobat	1902	Swiss
William R. Cremer	1903	English
Institute of International Law	1904	Interna'l
Bertha von Suttner	1905	Austrian
Theodore Roosevelt	1906	American
Louis Renault	1907	French
Ernesto T. Moneta	1907	Italian
K. F. Arnoldson	1908	Swedish
M. F. Bajer	1908	Danish
Baron d'Estournelles de Constant	1909	French
M. Beernaert	1909	Belgian
International Peace Bureau	1910	Berne
T. M. C. Asser	1911	Dutch
Alfred Fried	1911	Austrian
Elihu Root	1912	American
Henri La Fontaine	1913	Belgian
International Red Cross	1917	Geneva
Woodrow Wilson	1920	American
Hjalmar Branting	1920	Swedish
Christian L. Lange	1921	Norwegian

Nome, formerly the largest city in Alaska, is situated on the Seward Peninsula and on the north shore of Norton Sound, an arm of Bering Sea. The Seward Peninsula is the most westerly projection of Alaska. In 1898 the streams in the vicinity of the present city were found to bear gold and rich deposits were discovered in 1899. A rush for the gold fields followed and a large but flimsy town soon grew up, and flourished for a brief period.

Nome was the educational and commercial center of Alaska for some time, but the capital, Juneau, has surpassed it. Nome, however, has schools, a library, electric lights and a telephone system. It has rail connection with a few surrounding settlements and has steamer connection with the outside world from early June to mid-October. Population, 1923, 2,000.

Nordau, Max Simon (1849-1923), a German-Jewish physician and author, born in Budapest. He studied at the university there, and after six years of travel, began to practice medicine in the city in 1878. Two years later he went to Paris, where he studied for a time and then took up the practice of his profession. Dr. Nordau began early to contribute articles to various German papers and magazines, serving variously as dramatic critic, correspondent, and editorial writer. He has worked with great energy toward the uniting of the Jews in a nation at Jerusalem. Many of his writings are scathing criticisms of society as it exists today, maintaining that civilization has made men physical and mental degenerates. Among his best-known books, always written in German, are *Parisian Studies and Portraits, Paris Under the Third Republic, Conventional Lies of Society, Degeneration, Paradoxes, The Malady of the Century, A Comedy of Sentiment, The War of the Millions,* and *The Right to Love.*

Nordenskjöld, nor'den-sheld, **Adolf Erik** (1832-1901), a Swedish explorer. He was born at Helsingfors, Finland, and was educated at the university of that name. With his father, a noted mineralogist, he explored the Ural Mountains. Owing to his political views, he was required to leave Finland. He went to Sweden, where he became superintendent of the mineralogical department of the Swedish museum in Stockholm. He was an active man of an adventurous nature. He was employed by the Swedish government in several Arctic explorations. He reached a point in the Arctic Ocean farther north than had been attained by any predecessor. He also penetrated farther into the interior of Greenland than had been attempted previously. June 22, 1878, he set out from Karls-krona to make the attempt of circumnavigating the northern coast of Europe and Asia. He passed along the northern coast eastward, as far as Bering Strait, where he passed the winter. The following spring he continued his journey to Yokohama and returned home by way of the Suez Canal. He was the first white man to accomplish this journey. He published a number of works on early explorations. He died in Sweden. See ARCTIC REGIONS.

Nor'dica, Lillian (1859-1914), American singer, noted for her work in grand opera. She was born at Farmington, Maine, her real name being Lillian Norton. She adopted Nordica later as her stage name. Her first studies were pursued at the Boston Conservatory; later she went to Milan, where she studied under a noted Italian teacher, Sangiovanni. Madame Nordica scored a great success in St. Petersburg as singer in the Imperial Opera House, in Paris, London, and New York, appearing in such operas as *Traviata, Les Huguenots,* and *Aida.* In 1894 she played in the Wagner Theater of Bayreuth as Elsa in *Lohengrin.* Madame Nordica was married twice.

Norfolk, a city in Virginia, noted as a United States naval station. It is located on the Elizabeth River, an arm of Chesapeake Bay, on the Albemarle and Chesapeake and the Dismal Swamp Canals, and is eight miles from Hampton Roads. Across the river lie Portsmouth and Berkeley; the three cities are practically one. Norfolk and Portsmouth form a single customs district, and together make the largest naval station in the United States. This includes a large shipyard and a coaling station which handles over 2,500,000 tons of coal each year. The fine harbor is defended by Fortress Monroe. Some of the noteworthy public buildings are St. Paul's Church, built about 175 years ago, the custom house, the Carnegie library, and two large hospitals. Located there are Leach-Wood Seminary, Norfolk Mission College, Phillips-West School for Girls, Norfolk Academy, and Norfolk College for Young Ladies. Owing to its excellent water facilities Norfolk is noted for its shipping. It is the terminal point of a number of lines, some of them transatlantic. The commodities handled include oysters, fruit and

vegetables, lumber, grain, coal, cotton, canned goods and peanuts. It is also a stock trading center. In 1920 the population was 115,777.

Normal School, a school for the training of teachers. American normal schools received their first impulse from Germany. In that country no person can become a teacher, even of a rural school, without first taking a training course. In 1839 the first training schools in the United States were established at Lexington, Barre, and Bridgewater, Massachusetts. The credit belongs to Horace Mann, then the executive officer of the state board of education. The legislature regarded these schools as an expensive and hazardous experiment. The first appropriation for their support was made for three years only. The schools proved so successful, however, that they were provided with buildings and were made a permanent part of the state system.

From Massachusetts the movement spread westward and southward. New York was the second state to establish normal schools. Michigan was the first of the newer states to establish a training school. In 1864 the first normal school on the Mississippi River was established at Winona, Minnesota. The Cook County Normal, with which Colonel Parker was connected, was established in Chicago in 1867. The Canadian provinces have a thorough system and insist on attendance.

In 1920 there were in the United States according to the report of the Commissioner of Education 371 normal schools and forty-six teachers' colleges, which had a four-years' course above the secondary school, and granted degrees of these; thirty-seven were formerly state normal schools, four were private institutions, four were formerly classed as colleges or universities and one was a private secondary school. In addition to the institutions mentioned above, city training schools are found in most of the large cities. Their purpose is to prepare teachers for their respective cities and their courses of study are prepared to meet city needs.

The report of the United States Commissioner of Education for 1919-1920 gives the following statistics for normal schools:

Schools reporting	371
Institutions	
Men	3,560
Women	6,027
	9,587
Students	
Men	29,149
Women	133,647
	162,796
Graduates	
Men	2,151
Women	18,861
	21,012
Enrolled in model schools	92,466

Many years ago I set myself to the work of studying the methods of schools for the training of teachers, having noticed the superiority of their graduates over those without professional education, both in furnishing skilled teachers and inspiring them with a professional zeal that causes them to improve for many years after entering the work of teaching. . . .

The teacher who is to teach these elementary branches after graduation finds no work of preparation in the normal school half so valuable as this review of those branches in the light of more advanced studies. No work that is done in the secondary school—that is to say, the high school or academy—is an equivalent for the normal-school work done on the same studies. What is learned for the first time in the elementary or the secondary schools is learned as a step to what lies beyond. Thus, arithmetic is a step towards algebra, and geography a step towards the organic sciences, such as biology, geology, and ethnology. When the pupil has climbed to the studies beyond, he drops the elementary steps out of sight. Of course it follows that, in the high school or in the college, those lower branches are not reviewed in the light of the higher branches—arithmetic is not studied anew in the light of algebra and geometry; descriptive geography is not reviewed in the light of physical geography, botany, zoölogy, and geology; English grammar is not reviewed in the light of studies in Latin and Greek, or in philosophy and logic; nor the history of the United States seen in its relations to that of Great Britain and the continental nations of Europe.

But the teacher needs precisely this reexamination of all his elementary branches in their relations to the higher studies that furnish them their rules and laws.

It has happened that the American normal school has taken up just this work of review from the beginning, and has performed it well during the entire sixty years of its existence. . . . . The higher the standard of preparation in the pupils who enter the normal school, the more profitable is this work of reviewing the lower branches in the light of the higher, and thus studying them constructively.—U. S. Commissioner Wm. T. Harris.

Normans, a term meaning Northmen.

It was applied in a general way to the people of Scandinavia, but particularly to the Vikings, who, in the tenth century, established themselves in the valley of the Seine. They were great rovers and plunderers. They had previously ascended the Seine as far as Paris, from which they had been persuaded to retire only on the payment of gold. Charles, the king of western France, was glad to form a treaty with their leader, Rollo, giving him his daughter in marriage. The lower valley of the Seine was ceded to the Normans, together with the northern coast from Picardy to Brittany. It is still known as Normandy. It is one of the most fertile districts of France, famous for wheat, apples, and cider. The Channel Islands, including Jersey and Guernsey, are a part of ancient Normandy. Dieppe, Havre, Caen, Bayeux, and Cherbourg are Norman cities. The Norman capital was Rouen. The Norman invaders were, of course, far outnumbered by the native French. They were soon absorbed by the common people and adopted their language and religion. In 1066, William, duke of Normandy, crossed the English channel and seized the throne of England, which his family held until the accession of the Plantagenets in 1154. See BAYEUX TAPESTRY; WILLIAM I; HASTINGS.

Norns, in Scandinavian mythology, the Three Fates who preside at birth and decide human destiny. They correspond to the past, present, and future, and are represented by three young women. They sit under the world tree, Ygdrasill, in Asgard, and there cast the fates of gods as well as of men. Women who possessed the gift of prophecy were also called Norns. See MYTHOLOGY, SCANDINAVIAN; ASGARD.

Norris, Tobias Crawford (1861-), a Canadian statesman, was born at Brampton, Ontario, but removed to Manitoba while still a young man. In this province he engaged in farming for a time, and also was active in municipal politics. His ability in the latter field won him attention, and he was elected to the Manitoba legislature as a Liberal member for Lansdowne. After serving for seven years he was re-elected in 1907, and in 1909 was elected leader of the Liberal opposition. After the fall of the Robin government in 1915, Mr. Norris became premier of Manitoba; but his government was defeated at the election of 1922 and he was succeeded by a farmers' government headed by Hon. John Bracken.

Norristown, Pa., an industrial borough, and the county seat of Montgomery County, is situated on the Schuylkill River, the Schuylkill Canal, and on several railroads, 17 miles west by north of Philadelphia. This city is noted for its many manufactures, chief among which are hosiery, underwear, shirts, rugs, carpets, glass, boilers, silos, paper boxes, agricultural implements, knitting machines, tacks, bolts, nuts and screws. Valuable deposits of limestone, granite and marble add to the city's wealth.

Norristown contains a state hospital for the insane, the McCann Public Library. St. Joseph's Protectory for Girls, the Friend's Home, the Agnes Stinson Home for Aged Ladies, a high school, and graded public and parish schools. Norristown is only six miles from Valley Forge, famous as Washington's headquarters in the winter of 1777. Population in 1920, 32,319.

Norsemen, or **Northmen,** the bold seamen who descended from the coasts of Denmark, Norway, and Sweden, to ravage and plunder on the northern seas and off the coast of Great Britain. They are usually referred to as vikings, meaning sons of the fiord. They were found in greatest number during the period from the eighth to the twelfth centuries. They were brave sailors and constructed substantial ships, in which they gradually sailed farther and farther, until the beginning of the ninth century when they were gaining their spoils as far south as the waters of the Mediterranean. In England they were referred to as Eastmen and Danes. In France, where Charles the Simple allowed them to make their home with the understanding that they should befriend him and Christianity, they received the name of Normans. In the year 1000, Leif, the son of Eric the Red, (if we are to believe what legend and history record) discovered the coast of America, and he named the land he found Vinland. Leif sailed directly from Green-

land where his father had previously located. A colony is said to have been established there some seven years later, but here fiction mingles with fact, and nothing more is known about this early venture. Gradually the power of these stern sea-rovers was lessened, because of the great number from their ranks who were killed on the venturesome expeditions, and after a lapse of time they were no longer dreaded or referred to as the sole sea-kings of the North.

North, Christopher (1785-1854), the pen name of John Wilson, a noted Scottish writer. He was born at Paisley and educated at Glasgow and Oxford universities. Inheriting a considerable estate from his father, Mr. North settled in a picturesque region of Scotland and devoted his time to poetry. He made the acquaintance of Wordsworth, Southey, De Quincy and Coleridge; and between 1812 and 1816 he produced two volumes of exquisitely graceful poems, *The Isle of Palms* and *The City of the Plague*. Losing his fortune shortly after, he went to Edinburgh. Here he took part with J. G. Lockhart in the production of *Blackwood's Magazine*. Mr. Wilson was a leading writer of this celebrated Tory magazine until near his death. In 1820 he secured the chair of moral philosophy at the University of Edinburg. In 1822 Mr. Wilson began in *Blackwood's* the symposium called *Noctes Ambrosianae,* in which his wit, humor and pathos are seen at their very best. For a time he also contributed a large amount of prose fiction, which was later collected and published as *Lights and Shadows of Scottish Life, The Trials of Margaret Lyndsay* and *The Foresters*. After 1825 he wrote voluminously and well on Homer, Spencer, and on all kinds of contemporary writers and subjects. He resigned on a pension for the remainder of his life.

North, Lord Frederick, Second Earl of Guilford (732-1792, a British statesman whose hostility toward the American colonies was partly responsible for the Revolutionary War. He was born in London and educated at Eton and at Oxford. In 1754 he entered Parliament. From 1759 until 1765, Lord North was Junior Lord of the Treasury. He was paymaster for a short time in 1766, and in the same year became a member of the Privy Council. In 1767 he was chosen Chancellor of the Exchequer, and it was during his time in this office that the tax on tea was imposed that stirred the English colonies in America. Lord North became Prime Minister in 1770. Horace Walpole called him the ostensible minister, for the real minister was George III. In 1778 he renounced his right to tax the colonies, and in 1782, finding it no longer possible to carry on the war, he resigned. It is said that Lord North was personally the most estimable of men, but he was so far ruled by George III that all of his plans for the good of the state came to naught.

North Adams, Mass., an industrial city, is on the Hoosac River, and on the Boston & Albany and the Boston & Maine railroads, 50 miles northwest of Springfield. The city has a beautiful location in the Berkshire Hills, and at the foot of Greylock Mountain, the highest peak in the state; and Hudson Brook is here crossed by a natural bridge. The city is near the west end of the Hoosac Tunnel. Among its manufactures are cotton, woolen and print goods, boots, shoes, cigars and machine shop products.

The city has a state normal school, North Adams Library, public graded and high schools, and parish schools. Here also is the site of old Fort Massachusetts, captured in 1746 by a force of French and Indians under Vaudreuil. The population was 22,282 in 1920.

North America. See AMERICA.

Northampton, England, the capital of Northamptonshire, the boot and shoe center of the British Isles, is situated on the River Nene, 65 miles northwest of London. It is a very old city; for many years it was in the possession of the Danes, who burned it in the year 1010. Today it is a busy industrial city with manufactories of iron, brass ware, brewery products, flour, paper, bricks, tile and the boots and shoes already mentioned.

The shire hall, town hall, corn exchange and St. Peter's church are the most notable buildings. Horse and cattle fairs are held frequently, and the city is one of the horse

THE VIKING'S SHIP

From the Painting by R. Deygas

racing centers of England. In 1921 the population was 90,923.

Northampton, Mass., a manufacturing city and the county seat of Hampshire County, is on the Connecticut River and on several railroads, 18 miles north of Springfield. Its delightful climate and picturesque location near Mount Holyoke and Mount Tom, have made it popular as a summer resort. Chief among its manufactures are silk thread, silk braid, silk hosiery, dress silk, baskets, caskets, hydrants, filters, brushes, boxes and cutlery.

Prominent features are Smith College, the largest American female college, a state hospital for the insane, an academy of music, the Clarke School for the Deaf, two public libraries and fine public schools. Here also is a municipally owned theater. The population was 21,951 in 1920.

North Battleford, Saskatchewan, is situated at the junction of the Saskatchewan and Battle rivers and on the Canadian Northern Railroad, 254 miles east of Edmonton. It is a division point on the Canadian Northern, which maintains here a large roundhouse and a repair shop. North Battleford is the commercial center of a prolific wheat and oats raising district, and there are industrial plants producing bricks, creamery products, aerated water, threshing machine blowers, sash and doors, bricks and cement building blocks. There is a large hospital, a collegiate institute and a library. All public utilities are the property of the municipality. In 1921 the population was 4,108.

North Bay, Ontario, the county town of Nipissing County, is on the eastern end of Lake Nipissing and on the Canadian Pacific, the Grand Trunk, Canadian Northern and Timiskaming & Northern Ontario railroads. In North Bay there are manufactories of lumber, furniture, boxes, bricks and machine shop and foundry products, and there are two large railway car repair shops. The city is the commercial center of an extensive lumbering and mining district. North Bay is headquarters for the French River tourist route, and is becoming increasingly popular with recreation seekers. The educational system includes a normal school, a collegiate institute and a fine library. In 1921 the population of North Bay was 10,092.

North Carolina, one of the thirteen original states of the American union. It lies on the Atlantic coast between Virginia and South Carolina. Area, including inland waters, 52,426 square miles. The surface is divided into three physical divisions—a wide coastal plain, a foothill or piedmont region, and the mountains. The coastal plain consists of land formed by the wash of the continent. Albemarle and Pamlico sounds, two broad, shallow bodies of salt water, indent the coast deeply. Their outer border is a reef of sand brought down by the rivers and tossed back by the conflicting currents of the tides. West of the piedmont region rise the Blue Ridge, the Black and the Great Smoky mountains. Over a score of peaks tower to a height greater than that of the White Mountains of New Hampshire. Mitchell Peak, 6,711 feet high, is the loftiest mountain east of the Mississippi.

The People. In 1920 the inhabitants of North Carolina numbered 2,559,123, of whom somewhat less than one-fourth were Negroes. The density in that year was 52.5 to a square mile, and only 19.2 per cent of the population was urban. Fourteen cities in the state have a population exceeding 10,000, but only four exceed 25,000. The largest city is Winston-Salem, 48,395; this is followed by Charlotte, 46,338; Wilmington, 33,372; Asheville, 28,504; and Raleigh, 24,418.

Surface and Drainage. The average annual rainfall is from forty-five to sixty inches, according to location. The rivers are numerous and large in proportion to their length. Their general course is from northwest to southeast. Boats ascend as far as the foothills, an average distance of 100 miles, where further navigation is prevented by rapids and cascades. In fact, the shore of the old continent is a line of rapids and waterfalls throughout its entire extent from Virginia to South Carolina. A descent of fifty feet in two miles is not unusual. It is one of the great waterpower regions of the world. Almost all of the rivers of the coastal plain rise in the Blue Ridge Mountains, which are on the eastern

border of the mountain region; the course of these rivers is generally southeast, and almost all of them end in wide, deep harbors. The Pasquotank, Chowan and Roanoke empty into Albemarle Sound, while into Pamlico Sound flow the Tar and the Neuse. The Northeast River, South River and Cape Fear River, having a more directly southerly course, flow into Cape Fear. West of the Blue Ridge Mountains the drainage is into the Mississippi River by way of the headwaters of the Tennessee River. The largest rivers of western North Carolina are the French Broad, New Wautauga and Little Tennessee.

MINERALS. The coast region is rich in marl. Gold, mica, iron and pottery clay are found farther west. There are deposits also of silver, tin, lead and zinc. Coal, iron and magnesium limestone are found near together. There are over two hundred gold mines. The marble and granite are of a fine quality, and millstones of excellent quality are quarried. Of gems, opals, agates, garnets, amethysts, rubies, emeralds, and even diamonds are found. There are a number of noted mineral springs. Copper, soapstone, talc, magnetite, feldspar and glass sand occur in the state.

AGRICULTURE. Between the flat swamp lands of the coast and the ranges of the west there is a diversity of soil and climate. Corn is a universal crop. Rice is raised on the coast, and half a million bales of cotton are raised yearly. In the production of tobacco North Carolina ranks second in the Union, and in sweet potatoes and peanuts it ranks high. Of late a large area following the coast has been devoted to trucking. Early lettuce is grown with slight protection. In the elevated west the valleys between the mountain ranges are the natural home of the apple tree; the apple orchards never have failed to bear a crop. In some counties the wild huckleberry crop is very large. Corn and cotton thrive in the rich soil of this state, and cotton is the most important crop. Sugar cane is grown in the southeast, and a small amount of rice. The importance of North Carolina's agricultural industry is illustrated by the fact that in 1921 the state ranked fifth in the total value of its farm products.

FORESTS. The coastal plain is still covered in part by extensive forests of southern pine, yielding turpentine, tar, pitch and resin. A dweller in these tar-producing pine barrens is known colloquially as a "tarheel," and North Carolina is sometimes dubbed "The Tarheel State." Many uncleared swamps are cypress jungles. Palmetto, magnolia and live oak are found near the coast; oak, maple, elm, hickory, ash, walnut and other valuable furniture and vehicle timber is found in the central region; while the fir, hemlock and white pine and other timber trees are found in the western mountains.

FAUNA. The forests still shelter the gray squirrel, fox, raccoon, opossum and rabbit. A few beavers still build their lodges in the streams; wild turkeys are found in the mountains, and quail and partridges abound in the hardwood regions. Snipe and woodcock are found in the lowlands. Waterfowl are abundant along the coast.

FISHERIES. The fisheries of the state are of commercial importance. A large appropriation is expended in the maintenance of fish hatcheries and in protecting oysters and shellfish. The annual catch of shad, herring, bass, perch, oysters, shellfish and diamond-back terrapin employs from 10,000 to 15,000 persons.

MANUFACTURES. Since utilization of her water power began, North Carolina has steadily increased in importance as a manufacturing state. The two important industries are the manufacture of cotton products and of tobacco products. Next in point of value is the lumbering and lumber products industry; these produce rough and finished lumber, furniture, tar, resin and turpentine. Flour, fertilizer, cotton-seed oil and cake, knit goods and leather are produced in large quantities. There were 5,999 manufacturing establishments capitalized at $669,144,096 at the last industrial census. In 1920 North Carolina had 550 cotton mills with 5,321,450 producing spindles. The principal centers of manufacture are Charlotte, Durham and Winston-Salem.

TRANSPORTATION. In the matter of transportation North Carolina is fortunate,

Wheat Elevators

Landing on Missouri River

NORTH DAKOTA SCENES

First Log House in Walsh County, North Dakota

Sod Shack on the Prairie

TYPICAL HOMESTEADERS' HOUSES

being provided with 5,522 miles of steam railroads, and with about 350 miles of electric lines. Albemarle Sound and Chesapeake Bay are connected by the Dismal Swamp Canal, and a number of the rivers are navigable for some miles upward from their mouths. The commercial center of the state is Wilmington, which has direct steamer connection with New York, Philadelphia and Baltimore. The principal railroads are the Southern, Seaboard Air Line, Norfolk & Southern and the Atlantic Coast Line.

Charities and Corrections. The charitable institutions, controlled by a board of public charities, are hospitals at Goldsboro, Raleigh and Morganton, School for the White Deaf at Morganton, School for Colored Blind and Deaf at Raleigh, Soldiers' Home at Raleigh, Orphanage for Colored Children at Oxford, Stonewall Jackson Training School at Concord, Tuberculosis Sanitarium at Aberdeen and a School for the Feeble-Minded at Kinston. The state prison is at Raleigh. There are also many private hospitals, sanitaria and homes.

Education. School attendance in North Carolina is compulsory for both white and Negro students, for whom separate institutions are provided. In 1920 there were 455 public high schools and 9 public normal schools in the state, as well as 15 university and college institutions. Of the latter, the more important are the University of North Carolina, College of Agriculture and Engineering, State College for Women, Meredith College, Greensboro Female College, Davidson College, Biddle University, Livingston College and Shaw University, the last three for colored students, Wake Forest College and Lenoir College.

The University of North Carolina, at Chapel Hill, is one of the oldest state universities in the United States. It was founded in 1789 and opened in 1795. At the close of the Civil War it was found that the university was almost without funds, and during the reconstruction period its doors were closed. It was opened in 1875, however, and has been sustained largely by state aid since 1881. The university comprises colleges of liberal arts, applied science, pharmacy, engineering, mining and law; and college and university graduates and young men preparing to teach or for the ministry may receive instruction without paying tuition. The university has a library of 79,500 volumes. In 1922 the faculty numbered 126.

Government. North Carolina is one of the thirteen original states of the Union, but it is not governed under its original constitution. The present constitution, the fourth one the state has had, was adopted in 1876 and has been amended several times.

The legislature consists of a senate of 50 members and a house of representatives of 120 members, all elected for two years. Elections are in the charge of a state board of electors appointed by the governor.

Executive power is vested in the governor, lieutenant-governor, secretary of state, attorney-general, treasurer, auditor and superintendent of public instruction.

The judicial system comprises a state supreme court of one chief justice and four associate justices, superior courts, ditsrict courts and courts of justices of the peace.

North Carolina has legislated wisely for the regulation of the hours and conditions of labor for women and children.

History. The first attempts to found colonies in North Carolina were not successful. A colony was planted on Roanoke Island in 1587. The descent of the Spanish Armada prevented the sending of supplies, until 1590. When the returning ship reached the site the colonists had disappeared. No trace has ever been found of the lost colony of Roanoke. Virginia Dare was the first white child born in Roanoke and in America (August 18, 1587). The first permanent settlers drifted in from Jamestown, Va. The early settlers were troubled by attacks of the Tuscarora Indians and of pirates. "Blackbeard," the leader of the pirates, was killed in 1718. The region was cut up from time to time among several lord-proprietors. North and South Carolina were definately separated in 1729.

Among the elements that came in were Scotch covenanters, Highland Scotch after

the battle of Culloden, Moravians escaping from the persecution of the Austrians, and Scotch-Irish, by way of Charleston.

North Carolina joined Virginia in the French and Indian War and followed her example in opposition to the Stamp Act and the importation of tea. The Revolutionary engagements of King's Mountain and Guilford Court House were fought in North Carolina.

North Carolina was the last colony but one to ratify the Constitution. This act was deferred until November, 1789, when Washington had already been President for seven months. Tennessee, formerly a part of North Carolina, was ceded to the United States, and was accepted April 2,1790. North Carolina was also the last state but one to secede from the Union. The act of secession was passed May 20, 1861. Over 127,000 North Carolina men entered the Confederate army, a larger number than was furnished by any other southern state.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	48,740
Water area, square miles	3,686
Forest area, acres	18,000,000
Population (1920)	2,559,123
White	1,783,799
Negro	736,407
Indian	11,824
Foreign born	7,099
Chief cities:	
Winston-Salem	48,395
Charlotte	46,338
Wilmington	33,372
Asheville	28,504
Raleigh	24,418
Number of counties	100
Members of state senate	50
Members of house of representatives	120
Salary of governor	$6,500
Representatives in Congress	12
Assessed valuation of property	$3,158,480.072
Bonded indebtedness	$11,513,400
Farm area, acres	20,021,736
Improved land, acres	8,198,409
Corn, bushels	49,254,000
Sweet potatoes, bushels	10 302.000
Wheat, bushels	4,500 000
Potatoes, bushels	4,048.000
Rice, bushels	10 000
Oats, bushels	3,060.000
Rye, bushels	273.000
Cotton, bales (500 lbs)	800,000
Sorghum syrup, gallons	3,008,000
Tobacco, pounds	294,264,000
Peanuts, pounds	129,579,000
Wool, pounds	420,000
Domestic Animals:	
Horses	179,000
Mules	231,000
Milk cows	331,000
Other cattle	386,000
Sheep	138,000
Swine	1,528,000
Manufacturing establishments	5,999
Capital invested	$669,144,096
Operatives	157,659
Raw material used	$526,906,181
Output of manufactures	$943,807,949
Miles of railway	5,522
Teachers in public schools	17,836
Pupils enrolled	722,117

Northcliffe, Lord (Alfred Charles William Harmsworth) (1865-1922), English newspaper publisher and editor, was born July 15, 1865, in Chapelizod County, Dublin, Ireland. He was chairman of the British War Mission to the United States in 1917 during the World War, and was chairman of the British War Mission (1917-18). He was also Director of Propaganda in Enemy Countries in 1918. The life of Lord Northcliffe reads like fiction. He was a publisher at 16 and a millionaire at 30. From a poor boy he became one of the great journalists of the world, and one of the few great men in the British empire. The Chicago *Tribune*, in an editorial on his untimely death, said that "He was an important factor in making Great Britain victorious in the war, and that he was one of the great peacemakers of his age." He was an imperialist in the best sense of the word and was instrumental in maintaining friendly relations between the United States and Great Britain. In his newspapers he carried out the "human interest" idea. He held the idea that people liked to see their own pictures and those of other people and of what they were doing, and to him is attributed the introduction of the graphic idea in modern journalism. In the management of his papers he was a believer in the idea of one-man power. And this he also advocated in his newspapers. Lord Northcliffe instituted many reforms in newspaper management, such as the five-day week for editors, sub-editors and reporters.

He was not only a friend of the United

States, broadly speaking, but he was also the personal friend of a large number of individual Americans. He had played so bold and uncompromising a part in the making and unmaking of British Cabinets, and in foreign as well as domestic politics, that he could but have made bitter enemies while he was making strong friends. But antagonisms were forgotten when the general tribute was paid to his lovable qualities and his genius for affairs.—ALBERT SHAW.

North Dakota, in order of admission, the thirty-ninth state of the American Union. It lies on the Canadian border, between Minnesota and Montana, fairly midway between the two oceans. The state is rectangular in shape, save that the eastern border is formed by the Bois de Sioux and Red Rivers. Area, 70,797 square miles. Speaking in a general way, the surface is a vast level or rolling prairie. The Turtle Mountains on the Canadian border rise to a height of 2,500 feet. The southwest corner of the state contains a series of hills and scattered buttes, the Bad Lands. A region of clay and soft stone buttes lies near the western border. When a young man Theodore Roosevelt tried his hand at ranching at Medora in this region.

TOPOGRAPHY. The Missouri enters the western border just above the mouth of the Yellowstone and flows southeastward through a broad valley bordered by high bluffs. It is a yellow flood with shifting sands, but is navigable for steamboats under skillful pilots. The Red River of the North, navigable for small boats as far as Grank Forks, flows northward to Lake Winnipeg. It drains the former basin of a vast glacial inland sea known as Lake Agassiz. A loop of the Mouse River enters from Canada. Between the Red and the Missouri are the parallel valleys of the Sheyenne and the James. The former turns sharply eastward into the Red. The James continues southward for 600 miles to the Missouri. It is longer than the Elbe, the Rhone, or the Seine; but, except in time of flood or melting snow it has the appearance of a prairie creek. It is said to be the longest non-navigable stream in the world. Its entire valley is a vast artesian basin. Flowing wells may be had anywhere. North of the headwaters of the Sheyenne lies Devils Lake, the Minnewaukan of the Dakotas. It is a shallow, brackish body of water about twelve by fifty miles in extent, having no outlet.

THE PEOPLE. In 1920 the inhabitants of North Dakota numbered 646,872, showing an increase of 11.9 per cent over 1910, and placing the state in thirty-sixth place in point of population. The foreign born element in the state comprises the most desirable of immigrants — those from Canada and from the north of Europe—Norwegian, Russian and German. Only three cities in the state have a population exceeding 10,000; the per cent of urban residents in 1920 was only 13.7, next to the smallest urban population among the states.

MINERALS. In coal area North Dakota ranks fourth in the Union. Lignite coal appears to underlie the entire western section. Its manufacture by pressure into briquettes has begun. It is hoped that in this form, it may prove satisfactory for the use of locomotives. It is believed that the vast amount of cheap fuel at hand may be utilized to pump the waters of the Missouri into irrigating ditches and convert a large area, now sparsely covered with grasses, into farming lands of unsurpassed fertility. The natural richness is in the soil, waiting only for moisture.

Aside from glacial boulders and standstone in the west, the state is remarkably deficient in building stone. Brick clay is, however, abundant, and of excellent quality. Face brick, firebrick and tile are already articles of export. A limestone suitable for Portland cement of high grade has been found in Cavalier County. This furnishes material for concrete work.

AGRICULTURE. North Dakota is naturally an agricultural and stock-raising state. The Red River Valley is considered one of the most fertile wheat-growing sections of the world. The valleys of the Mouse, Sheyenne and James bring the annual wheat crop up to 70,000,000 bushels. The leading grade, "No. 1 Hard," is considered the best flour-producing wheat known. North Dakota leads the Union in the production of flax. Next to wheat and flax, in order of importance, come oats and barley, corn and potatoes. A large amount of wild hay is baled and exported.

The amount of rainfall decreases from east to west. The Red River Valley expects twenty inches a year; the western border, half that amount. The one hundredth meridian is theoretically the limit of successful field crops, but there are semi-arid sections east of that line, and there are excellent agricultural lands west of it, especially at the big bend of the Missouri.

The western section is devoted largely to stock raising. Native grasses cured in the stalk afford the best of feed the year around. Dakota grass-fed cattle command the best of prices. The wool clip is rather above 1,500,000 pounds a year. Of late, creameries and cheese factories have sprung up in various parts of the state.

MANUFACTURE. In 1920 North Dakota had but 1,414 manufacturing establishments capitalized at $30,933,030. These were engaged almost exclusively in making flour and grist mill products, clay products, foundry and machine shop products and dairy products.

TRANSPORTATION AND COMMERCE. The state is crossed from east to west by the Northern Pacific and the Great Northern railroads. The Soo, the Milwaukee and the Northwestern systems reach extensive sections. The larger towns are situated at the points where the railroads cross rivers. Fargo, at the Northern Pacific crossing of the Red River, is said to distribute more gang plows, seeders, drags, binders and threshers than any other town in the world. Grank Forks, eighty miles farther north, at the Great Northern crossing, is also a distributing center of importance. Other Northern Pacific towns are Valley City, at the crossing of the Sheyenne, and Jamestown on the James; while Bismarck, the capital, and Mandan, an old Indian encampment, are on opposite sides of the Missouri. Devils Lake and Minot are two growing railroad and distributing centers on the Great Northern Railroad in the northern part of the state.

INSTITUTIONS. A State Board of Charities and Corrections is in charge of North Dakota's public institutions, which include a hospital for the insane at Jamestown, an institution for the feeble-minded at Grafton, a reform school at Mandan, a school for the blind at Bathgate, a school for the deaf at Devils Lake and a tuberculosis sanitarium at Dunseith. The state prison is at Bismarck, and a Soldiers' Home at Lisbon.

EDUCATION. From the first North Dakota has taken a progressive stand, especially in matters of education. The national grant of sections sixteen and thirty-six in each township for educational purposes has been wisely managed. The larger towns maintain efficient high schools. A vigorous state university with a school of mines is established at Grand Forks; an agricultural college at Fargo; normal schools at Valley City, Mayville, Ellendale, Dickinson and Minot, a school of forestry at Bottineau and a scientific school at Wahpeton.

The University of North Dakota, established in 1883 by an act of the territorial assembly, is maintained principally by state tax and by funds derived from its holdings of land granted by the United States government. The university comprises colleges of liberal arts, law, mechanical, electrical and mining engineering, and education, and schools of commerce and medicine. A mining substation at Hebron and a biological station at Devils Lake are operated in connection with the university, and at this institution are a United States Weather Bureau station, a station of the United States Geological survey and a public health laboratory. In 1922 the student body numbered 1,857 and the faculty 115. The library contains about 65,000 volumes.

GOVERNMENT. The state is governed under its original constitution, adopted in 1889. The legislature is divided into a senate of 49 members and a house of representatives of 113 members; senators are elected for terms of four years, representatives for two years. All adult citizens and civilized Indians vote.

Executive power is vested in the governor, lieutenant-governor, secretary of state, attorney-general, treasurer, auditor, superintendent of public instruction and commissioners of agriculture, labor, railroads and insurance.

The judiciary consists of a supreme court and district, county, probate and justice of the peace courts.

HISTORY. As early as 1810, Lord Selkirk, supposing himself in the territory of the Hudson's Bay Company, founded a settlement, afterward abandoned, at Pembina on the Red River. Devils Lake was visited by Fremont in 1839; Mandan, by George Catlin in 1841. North Dakota was originally a part of the Territory of Minnesota. In 1861 the Territory of Dakota was organized, including at first Montana and parts of Idaho and Wyoming. In 1868 the territory was cut down to Dakota proper, and in 1889 it was divided and admitted to the Union as North Dakota and South Dakota.

STATISTICS. The following are the latest statistics to be had from trustworthy source:

Land area, square miles	70,135
Water area, square miles	662
Population (1920)	646,872
White	639,954
Indian	6,254
Foreign born	131,503
Chief cities:	
Fargo	21,961
Grand Forks	14,010
Minot	10,476
Bismark	7,122
Number of counties	53
Members of state senate	49
Members of house of representatives	113
Salary of governor	$5,000
Representatives in Congress	5
Farm area, acres	36,214,751
Improved land, acres	24,563,178
Wheat, bushels	73,264,000
Oats, bushels	49,761,000
Barley, bushels	16,988,000
Corn, bushels	16,940,000
Potatoes, bushels	11,520,000
Rye, bushels	9,306,000
Flax seed, bushels	2,534,000
Hay, tons	3,605,000
Wool, pounds	1,737,000
Domestic Animals:	
Horses	800,000
Milk cows	464,000
Other cattle	604,000
Sheep	272,000
Swine	402,000
Manufacturing establishments	1,414
Capital invested	$30,933,030
Operatives	6,382
Raw material used	$42,985,870
Output of manufactures	$62,170,782
Miles of railway	5,316
Teachers in public schools	6,342
Pupils enrolled	169,669

See WHEAT; LAKE AGASSIZ; BAD LANDS; MISSOURI RIVER; BISON.

Northern Lights. See AURORA BOREALIS.

North Pole. See ARCTIC REGIONS; PEARY.

Northrop, Cyrus (1834-1922), an American educator, was born in Ridgefield, Connecticut. He received his education at Yale University, taking the degree of bachelor of arts in 1857 and that of bachelor of laws in 1859. In 1860 he was admitted to the bar. He acted as clerk of the Connecticut House of Representatives in 1862, and of its senate the following year. In 1863 he was made professsor of rhetoric and English literature at Yale, which position he held until 1884 when he accepted the presidency of the University of Minnesota, filling that office until 1911, athough he would have retired earlier had it been possible to fill his place satisfactorily. When Dr. Northrop took charge of the Minnesota University there were enrolled at that institution 289 students, there was but one fully organized college, that of Science, Literature, and the Arts, and there were but two buildings on the campus. At his first commencement the new president conferred degrees upon nineteen students. The results of his administration of twenty-five years speak in his praise more forcibly than can words. In 1909, when Dr. Northrop offered his resignation, the University comprised ten fully equipped faculties, and graduated 550 students. There were twenty-three buildings on the campus and as many more on the Agricultural College grounds. Over 5,000 students were enrolled.

North Sea, a shallow body of water lying between the British Isles and the continent. If the tallest city buildings were set down in the deepest part of the sea, they would rise half way above the surface of the water. The northern boundary may be regarded as a line drawn from the most northerly of the Shetland Isles to the nearest point of the Norwegian coast. The extreme length from north to south is about 700 miles. The distance from Scotland to Denmark is somewhat over 400 miles. The total area of the German Ocean, as it is sometimes called, is somewhat less than 150,000 square miles. Its deepest portion

lies off the Norwegian coast. The average depth may be stated at about 175 feet. Numerous arms indent the neighboring coast, the most noted being that formed by the Baltic Sea. Several enormous sandbars or mud banks extend from the mainland. A shallow near the center, known as the Dogger Bank, is famous for its cod-fisheries. In fact, the entire sea forms one of the most valuable, if not the most valuable, fishing ground in the world. As a pathway of commerce, the North Sea ranks next to the Mediterranean. The entire basin has been formed by a sinking of the European coast. The British Isles were at one time a part of the mainland.

North Star. See POLE STAR.

North Sydney, Nova Scotia, is on Cape Breton Island at the entrance to Sydney Harbor, fifteen miles northwest of Sydney. It is served by the Intercolonial Railway and has steamer connection with Sydney, Montreal, Halifax and other Canadian cities and St. Johns, Newfoundland. Fisheries and coal mines contribute largely to the wealth of North Sydney, and there are factories producing stoves, heavy machinery, boilers and refined seal and cod oil. Fish drying and canning and the polishing of granite and marble are also important. Population, 1921, 6,585.

North Tonowanda, N. Y., an industrial city, is situated at the junction of the Niagara River and Tonawanda Creek, five miles north of Buffalo. The city is served by the New York Central, Erie, Lehigh Valley, Grand Trunk and Wabash railroads and by the International Electric Railway and is the western terminus of the Barge canal. North Tonawanda is important commercially and industrially, having an extensive trade in lumber and iron, and manufactories of pig iron, steam merry-go-rounds, gas engines, automatic organs, steam pumps, motor boats, roofing materials, nuts and bolts, steam pipe and miniature railroads. The most notable buildings are the post office, city hall, high school and Carnegie library. In 1920 the population was 15,482.

Northwestern University, situated on the western shore of Lake Michigan, in Evanston, Illinois, was founded in 1851. It is a coeducational institution under the auspices of the Methodist Episcopal Church, and is the largest institution in the United States connected with that church. The university buildings are among the most attractive in the middle west.

Northwestern comprises colleges of liberal arts and engineering, and schools of medicine, pharmacy, dentistry, law, journalism, commerce, music and oratory. Students are admitted on certificate from accredited secondary schools or by examination. The degrees granted are bachelor of arts and sciences, master of arts and doctor of philosophy.

At Evanston are located the college of liberal arts, college of engineering, school of music and school of oratory. The schools of pharmacy, dentistry, law, commerce and journalism are conducted in the Northwestern University Building, in the business district of Chicago. The medical school is on the south side of the city.

On the university campus is the affiliated Garrett Biblical Institute. Two other affiliated schools located in Evanston but not on the campus, are the Swedish Theological Seminary and the Norwegian-Danish Theological Seminary. At Onarga, Illinois, the university maintains Grand Prairie Seminary, and at Elgin, Illinois, it maintains the Elgin Seminary. Both are secondary schools.

The university buildings are attractively grouped on a campus that has an area of about 125 acres. The gymnasium for men, one of the best equipped in the world, and the Dearborn Astronomical Observatory, are notable among the numerous buildings. The university library houses not less than 200,000 volumes. In 1922 the faculty numbered 604 and the student body 8,519.

Northwest Passage, the name of the water route around the north of North America, connecting the Atlantic and the Pacific oceans. The world's best navigators sought this route for four centuries, but it was not until 1905, when Captain Roald Amundsen took his ship the *Gjoa* through from the Atlantic to the Pacific, that the complete passage was made by one man. The need for such a passage came in 1453, when the Turks took Constantinople and blocked the trade routes.

Columbus died firm in the conviction that he had reached India, but when it was learned that this was not so, a passage around the land he did discover was sought. Verrazano was the first to make the attempt, 1524. He got no farther than the present Rhode Island. Henry Hudson thought that the Hudson River, discovered in 1609, reached across the North American continent. Frobisher, the Englishman, went as far north as Frobisher Bay, Baffin Land; John Davis, another English mariner, succeeded Frobisher and went yet farther into the passage. England persisted in the search, in which Denmark, Holland and Russia later took part. From 1780 until 1818 activity in this direction was halted by the wars in Europe, but an expedition under John Ross set sail in the latter year, to be followed by numerous others. Sir John Franklin, as was learned by subsequent explorers, won through the Passage but lost his life with success in sight. Yet others made the attempt, but Amundsen's *Gjoa* was the first vessel to complete the Passage and survive.

Northwest Territory, in American history, a region lying north of the Ohio and east of the Mississippi. It comprised territory ceded at different times to the general government by Massachusetts, Connecticut, New York, and Virginia, whose claims were based on conflicting charters granted by the king of England. On July 11, 1787, nearly two years before the United States Constitution went into effect, a committee of Congress, then in session in New York, reported an ordinance for the government of the territory of the United States northwest of Ohio. This famous act is known in history as the Ordinance of 1787. It is estimated that, in the year following the passage of the act, not less than 20,000 men, women, and children settled on the banks of the Ohio.

Three clauses of the bill have become famous. One declared for public education: "Religion, morality, and knowledge, being necessary to good government and happiness of mankind, schools and the means of education shall forever be encouraged." The second ran, "There shall be neither slavery nor involuntary servitude in said territory otherwise than in the punishment of crimes, whereof the party shall have been duly convicted." The third clause provided that the property of parties dying without wills shall be divided equally among the children.

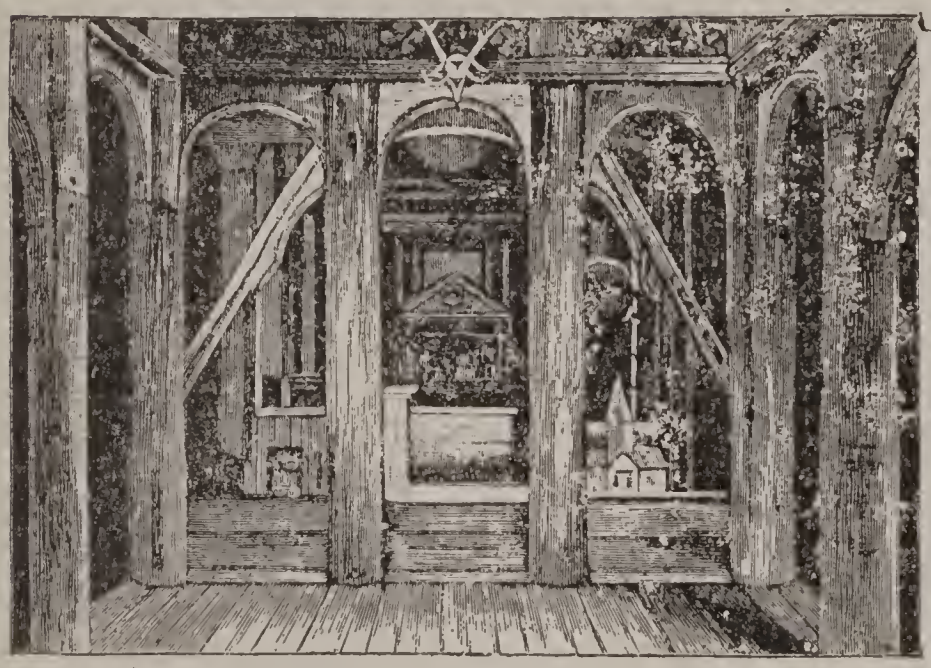
Norwalk, Conn., an industrial city, is on the Norwalk River and on Long Island Sound, 40 miles northeast of New York City, with which it has boat connections. The principal manufactures are hats, shirts, underwear, ladies waists, corsets, shoes, paper, silk, building hardware, air compressors, straw goods and rubber goods. Oystering is another important industry. Norwalk was burned in 1779 by a force of British under Generals Garth and Tryon. In 1920 the population was 27,557.

Norway, a kingdom of the Scandinavian peninsula. It is the most northwesterly country in Europe. It is 1,080 miles in extreme length and about 275 miles in extreme width. Norway is a more mountainous country than Switzerland. A vast billow rolling westward from the plains of Europe seems to have stopped suddenly and petrified at full height, presenting a precipitous crest along the Atlantic. There are numerous ridges and imposing peaks 8.000 feet high.

Climate, Forests, Etc. About one-fourth of the country lies in the Arctic zone. Owing to the influence of the Gulf Stream, the line of perpetual snow is beaten upward, however, to a height of from 3,000 feet in the north to 5,000 feet in the south. Were it not for oceanic influences Norway would be covered, no doubt, with a perpetual glacier like that which buries Greenland; but, under present influences, the isotherms run parallel to the coast. The coast line has warmer winters and cooler summers than the interior. Hammerfest, on the northern coast, several degrees above the Arctic Circle, has a warmer winter than Christiania, Stockholm, or St. Petersburg farther inland. The harbors of the western coast are always open. Seventy inches of rain and snowfall may be expected on the western coast and from ten to twelve inches on the eastern border. The mountain slopes are clothed well up with oak, beech, and magnificent pine forests

Old man and bridal pair.

Wooden church of Borgund.



Interior of same.

Norwegian mountain home.

Modern cottage near Christiania.

Swedish bridal pair and married couple.

NORWEGIAN AND SWEDISH CIVILIZATION.

Numerous song birds nest in Norway. Owls and grouse are permanent residents. Waterfowl and snipe are abundant in season. Seafowl and many other kinds breed by the million in the cliffs.

Population. Norway is the most sparsely populated country in Europe. The total area is 124,964 square miles. The population, 1920, was 2,646,306, over thirteen inhabitants per square mile. The total annual Norwegian fish catch is valued at about $45,000,000. An almost continuous chain of small islands, known as skerries, forms a natural breakwater, rendering navigation along the coast and in the fjords comparatively safe and delightful. Twelve hundred of them are occupied. They form about one-fourteenth of the entire area of Norway and are inhabited by about one-eighth of the population.

Industries. The leading occupations are fishing, lumbering, and commerce. One person out of twelve of the entire population is engaged in fishing. One hundred and twenty thousand men and 30,000 boats are engaged in catching cod, herring, mackerel, salmon, and sea trout. As high as 67,000,000 pounds of cod are taken off the Lofoden Islands in a single year. The annual Norwegian fish catch is valued at about $12,000,000.

Commerce. In proportion to population Norway has the largest commercial fleet in the world. Millions of dollars are earned annually carrying goods for French, Spanish, American, and even English merchants. Ships are gone from home for years. The principal Norwegian exports are lumber and fish; the principal imports are cloth, clothing, sugar, tobacco, and coffee. Instead of depositing their money in savings banks, many wage earners invest their savings in shares in industries. About one-fourth of the country is devoted to forestry. The chief manufactures of the country are lumber and timber products. Ships are built largely at Christiania. Much ship timber is exported to the Clyde. There is lack of coal, but water power is abundant. There are important manufactures of paper, as well as breweries, tanneries, and large factories. Norway is not without mineral wealth. There are mines of iron, copper, silver, cobalt, and nickel, and they are now worked extensively. The supply of building stone is unlimited, but it is too far from market to be a source of profit.

Agriculture. About three per cent of the surface is under cultivation. Farming is carried on with care. The Norwegian farmers are an industrious, thrifty, comfortable, self-respecting people. At the Christmas season, they never fail to put up a sheaf of grain on a pole for the birds. Small farms managed by the owner are the rule. Barley, potatoes, and hay are the principal field crops. Under the influence of short, warm summers, and the long period of daylight, barley matures even beyond the Arctic Circle in the same length of time, it is said, required in Egypt. Hemp and flax are produced abundantly. Tobacco grows in the south. Dairying is carried on extensively. Most farms include a tract of land extending far up on the mountain ranges where stock may be sent to pasture for the summer. Cattle, horses, sheep, and goats are raised. There are a few swine. Reindeer are herded in the extreme northwest, where wild reindeer are still found.

Historical. In early times Norway was the home of numerous petty jarls or chieftains and was notorious for piracy. Each fjord had its jarl, its war galleys, its crews of determined sea rovers. The kingdom of Norway is one of the most ancient in western Europe. Harold Fair Hair, Hako I, and Magnus the Good were noted rulers. The crown of Norway has been at times united with that of Denmark and that of Sweden. In 1814 the Congress of Vienna joined Norway to Sweden. The partnership was dissolved in 1905, when Prince Karl, the second son of the present king of Denmark, was invited to ascend the Norwegian throne. He assumed the name of Haakon VII. The government is, of course, a constitutional monarchy. There is no Norwegian nobility. The Parliament is known as the Storthing. The capital is Christiania. Bergen, a former capital, is one of the world's great fish markets. Trondhjem was a still earlier capital. It is yet the center of church affairs. Norwegian kings are crowned in its old cathedral.

Education. Education is compulsory. In sparsely settled districts teachers are employed at public expense to go from ham-

let to hamlet to instruct even the children of a single family for a few weeks. The larger towns have preparatory schools. The national university is located at Christiania. The people are largely Lutheran. Although stone abounds, the churches are almost without exception built of wood. Many contain artistic wood carvings.

SCENERY. Norway is a favorite region for the summer tourist. The scenery of the fjords is sublimely beautiful. The greatest waterfalls in Europe are there. The uplands attract hunters for grouse and anglers for trout. Tidy inns furnish comfortable accommodations. The great attraction of the traveler, however, is the phenomenon which has caused Norway to be called "Land of the Midnight Sun." In midsummer, from the Arctic Circle northward, the sun circles about without setting for days and even weeks. The farther north from the Arctic Circle, the longer this midsummer day. At midnight the sun descends toward the northern horizon, hangs there like a great red ball, and begins to ascend toward the east without setting. To one accustomed to live in a more southern country the effect is almost supernatural. People and animals go to rest at regular hours; poultry goes to roost while the sun still hangs high in the northwestern heavens. In midwinter the nights are of corresponding length. At the Arctic Circle the sun fails to rise. Still farther north the only indication of day is a short twilight at the noon hour. The mildness of the climate and the safety of steamer navigation must always make the coast of northern Norway a favorite region in which to observe this phenomenon. A telegraph line extends as far northward as Hammerfest.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	124,964
Forest area, square miles	27,434
Population (1920)	2,646,306
Chief Cities:	
Christiania	258,341
Bergen	91,081
Trondhjem	54,520
Stavanger	43,883
Number of districts	20
Members of legislation	150
National revenue	$235,000,000
Bonded indebtedness	$3,350,000,000
Farm area, acres	800,000
Wheat, bushels	941,000
Barley, bushels	4,310,000
Rye, bushels	1,115,000
Oats, bushels	12,742,000
Potatoes, bushels	27,305,000
Hay, tons	1,883,279
Domestic Animals:	
Horses	221,062
Cattle	1,049,642
Sheep	1,207,923
Goats	203,099
Swine	214,305
Imports	$706,705,000
Exports	$51,751,000
Manufacturing establishments	8,069
Operatives	158,259
Lumber products exported, value	$115,000,000
Fisheries products, value	$45,000,000
Whale oil, value	$39,900
Copper ore, value	$1,985,000
Silver, value	$305,000
Pyrites, value	$5,500,000
Iron ore, value	$650,000
Nickel ore, value	$105,000
Feldspar, value	$85,000
Miles of railway	2,139
Number of public schools	9,378
Pupils enrolled	378,900

I do confess
I love Old Norway's bleak, tremendous hills,
Where winter sits, and sees the summer burn
In valleys deeper than yon cloud is high:
I love the ocean-arms that gleam and foam
So far within the bosom of the land:
It is not that. I do confess to thee
I love the frank, brave habit of the folk,
The hearts unspoiled, though fed from ruder times
And filled with angry blood: I love the tales
That taught, the ancient songs that cradled me,
The tongue my mother spake, unto the Lord
As sweet as thine upon the lips of prayer.

Bayard Taylor.

Norwegian Literature. See LITERATURE.

Norwich, Conn., a manufacturing city and county seat of New London County, is 40 miles southeast of Hartford, on several railroads. At Norwich, the Yantic and the Shetucket Rivers unite and form the Thames, which up to this point is navigable. Water power developed from these rivers is an important industrial asset. The city's principal manufactures are cotton, velvet, silk, woolen goods, firearms, furniture, stoves, iron, leather belting and woodworking machinery.

Norwich has an art museum, a free academy, state armory, state hospital for the insane and fine public schools. The burial place of Uncas, the Indian chief, is

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TRINDE FALLS, NORWAY

Children Playing Near Farm House

here. In 1920, the population was 22,304.

Norwood, Ohio, an industrial and residential suburb of Cincinnati. It is northeast of and adjoins Cincinnati, and is served by several important railroads. The principal manufactures are playing cards, in the production of which it is among the first cities, if not the first city, in the United States; sectional bookcases, electrical supplies, washing machines, tools, safes, pianos and enamel signs. Some of the manufacturing plants of Norwood are notable for their architecture and equipment.

The city has a Carnegie library and branches of the Cincinnati public library; and there are fine public schools and many handsome residences. In 1920, the population was 24,966.

Notary, a public officer authorized by law to take affidavits, administer oaths, and to certify to the signatures of documents. The term is from the Latin, originally applied by the Romans to learned Greek slaves they employed to keep the records or notes of their public assemblies. The functions of the notary public vary. The English notary is an officer both of the church and state. In the United States notaries are appointed usually by the governors. Their duties are prescribed by statute. The statutes usually permit acknowledgments to be taken by a justice of the peace, a town clerk, a judge of probate, a county auditor, a clerk of the court, a notary, and sometimes court officers. Ordinarily, however, the statutes require that a deed or contract shall be acknowledged, that is to say, signed, before a notary public before it may be placed on record. In most states women may act as notaries. In France the notary is a person of considerable authority. To be legal, deeds, notifications, and contracts involving a value in excess of thirty dollars must be drawn up by the notary. Longfellow describes a French notary well in the account of the marriage contract drawn between the parents of Evangeline and Gabriel. The settlers of Grand Pré brought French laws and constitutions with them.

Notre Dame, nō′tr däm, the cathedral of Paris. It is one of the most renowned churches, not only of France, but of the world. It stands on an island in the Seine in the very center of the original city. It was founded in 1163. It was two centuries in building. As seen now it seems to stand low on the ground. It was approached formerly by a flight of thirteen steps, but the streets have been graded up until they are on a level with the main floor. The cathedral has the general form of a Latin cross. The transept is 417 feet long and 156 feet wide. The vaulting of the nave is 110 feet high, and is carried by seventy-five pillars. The vaulting of the aisles is lower, so that light can enter the clerestory of the nave through thirty-seven large windows. The organ is a magnificent instrument with 5,246 pipes and eighty-six stops. The pulpit is considered one of the finest specimens of modern wood-carving. The façade, or western front, is entered by three recessed portals. They were formerly adorned by many fine statues, but, during the French Revolution, Notre Dame was for a time condemned to destruction. The mob knocked off much of the sculpture. The façade has three stories. In the center of the second story there is a beautiful rose window forty-two feet in diameter. An unfinished tower rises from each corner of the western front. A bell weighing sixteen tons, one of the largest in use, hangs in the southern tower. The clapper weighs half a ton.

Nottingham, England, an important industrial city of northern England and the county town of Nottinghamshire, is on the River Leen at its confluence with the Trent, 125 miles north-northwest of London. Nottingham is among the older cities of England. It is built on a slope at the foot of a rocky height of land that is still crowned by an ancient castle. Its oldest charter was dated 1155, and in this instrument are incorporated the manufacturing rights granted by former kings to the citizens of Nottingham. Arkwright set up his original spinning frame here in 1769, and since a time even antedating that event by some centuries this city was a center of the cotton, silk, hosiery and lace industries. Other products of Nottingham's factories are bobbinet, linen, bicycles, iron, brass and baskets. There are numerous bleaching establishments, and nearby are valuable coal deposits.

Nottingham is the seat of a university college and there is a free grammar school, founded in 1513. Notable among the public buildings are the exchange, house of correction, city and county halls, several free libraries, baths and hospitals; there are asylums for the insane, an arboretum, a public park and a large public common. The Cathedral of St. Barnabas, St. Peter's Church and St. Mary's Church are beautiful structures. The city acquired the Castle of Nottingham in 1874 and converted it into an art gallery and historical museum.

The name of this interesting city is derived from the Saxon "Snottengaham" (Home of the Caves), which has reference to the caves nearby that served as places of refuge from the invading Danes. Nottingham Castle was built by William the Conqueror; in this castle many famous parliaments held their sessions. The city of Nottingham and Sherwood Forest, now almost denuded, are inseparably linked with the tale of the exploits of Robin Hood. In Nottingham Charles I planted his standard; the castle was dismantled by Oliver Cromwell in 1644 but was rebuilt after the Restoration. During the Reform Bill riots of 1831 it was partially destroyed by fire. The city has enjoyed a steady growth, and in 1921 the population was 262,658.

Nova Scotia, the easternmost, and except Prince Edward Island, the smallest, of the provinces of Canada. It comprises the Nova Scotia peninsula and the island of Cape Breton. Except at one point, where it is connected with New Brunswick by the twelve miles wide Isthmus of Chignecto, Nova Scotia has water boundaries, thus making especially appropriate its appellation of Maritime Province, which it shares with Prince Edward Island and New Brunswick. Nova Scotia has a coast line of 1,000 miles and an area of 21,428 square miles, a little more than the combined areas of New Hampshire and Vermont. The larger part of the province is an undulating plateau, with an altitude of about 400 feet in the southwest and rising to about 1,000 feet in Cape Breton. Three ranges of hills extend in a general southwest-northeasterly direction: the first, along the Atlantic, forms the backbone of the peninsula, and really is a plateau which narrows to the northeast and terminates in Cape Canso; second, the Cobequid Hills, which extend southward as a peninsula into the Bay of Fundy, and at their eastern end meet the coast range; third, the detached and very narrow North Range, along the south shore of the Bay of Fundy.

No point in Nova Scotia is more than thirty-five miles from the sea. The rivers, therefore, are short and small, with one or two exceptions not exceeding fifty miles in length. The largest are the Annapolis and the Shubenacadie. The former flows southwest and divides the North Range from the rest of the plateau and then flows southwest through the Annapolis Basin into the Bay of Fundy near its mouth. The Shubenacadie rises near Halifax and flows northward into Cobequid Bay at the head of the Bay of Fundy. There are several hundred lakes, most of them surrounded by woodland. Lake Bras d' Or, in Cape Breton Island, is really an inland sea.

Because of the ocean's influence Nova Scotia has a milder climate than its neighbors. The winters are usually free from severe cold and the summers from extreme heat, the mean temperature for winter being about 27° and for summer 65°. Rainfall and snow are heavy, and along the coasts fogs are frequent.

Natural Resources and Their Exploitation. Nova Scotia, in proportion to its size, is extraordinarily rich in forests, fish and minerals. The forests which originally covered the province were about equally divided between hard and soft woods, including principally oak, maple, birch, hemlock and spruce. The woods that remain are filled with violets and trailing arbutus, the latter so profuse that it gives Nova Scotia a motto, "We bloom amid the snows." It is estimated that the forests cover at least 7,000 square miles. Lumbering is one of the chief industries, localized in the western part, and large quantities of lumber are exported each year to the United States, Great Britain and South America.

Coal is Nova Scotia's most valuable

mineral. Its annual output of 6,000,000 to 7,000,000 tons was usually more than that of all the other provinces combined. The coal is a high-grade bituminous, found both on the mainland and on Cape Breton Island. Nearly two-thirds of the annual production was formerly exported to the United States. Iron ore has been found in every county but one, and gold in paying quantities has been discovered at various points along the Atlantic coast; gypsum and manganese are mined in Cape Breton and Hauts counties.

The third of the great natural resources, the fisheries, employs more than 30,000 men and yields an average product of over $15,000,000 a year. Except British Columbia these are the largest figures for any Canadian province. The most important catches are cod, lobsters, mackerel, herring and haddock. Salmon are found in many of the rivers.

Manufactures. Nova Scotia enjoys the unusual advantage of rich coal deposits near iron ore and limestone. It has therefore almost of necessity become a center for the manufacture of steel and iron products. The largest blast furnaces are at Sydney and New Glasgow. During the World War the manufacture of munitions in these and other centers supplanted peace occupations. Tanneries, woolen and cotton mills, fruit and vegetable canneries are important in various parts of the province. The value of all manufactures jumped from $23,000,000 in 1910 to $176,000,000 in 1917, partly as a result of war industries; but a considerable part of this expansion, particularly in iron and steel, will remain permanent.

Agriculture. Throughout Nova Scotia, hay and fodder crops are most important products. Especially along the shores of the Bay of Fundy and the Basin of Minas, where the early French settlers reclaimed the land from the salt marshes, the soil is specially suited to these crops. In many sections potatoes and other root crops are valuable. Oats, buckwheat and barley are the most important grains, but the crops are so small a part of the total for Canada that they are only of local significance. For hardy fruits, notably apples, on the contrary, Nova Scotia has a world-wide fame. In average years more than half a million barrels af apples are exported, largely to Great Britain and the United States. Cherries, cranberries, plums and other small fruits are extensively raised, the bulk of the crops being canned in local factories. As in the other eastern provinces, increasing attention is being given to dairying. The factory production of butter and cheese has not yet reached a large scale, but is growing steadily.

Government and Education. The government of the province follows the general plan of all the Canadian provinces, in having a lieutenant general, appointed by the governor general in council, and an executive council or cabinet, usually of nine members. Several of the ministers are without portfolio, their function being to assist in the legislature rather than as heads of executive departments. Unlike most of the provincial legislatures Nova Scotia has two chambers, a legislative council of twenty-one members appointed for life, and an elective legislative assembly of forty-three members. County affairs are controlled by a county council, elected by the voters of the county.

The public schools of Nova Scotia are free and non-denominational. About one-fifth of the funds required for their support is derived from a special provincial fund and the balance from local and municipal taxation. There is no provincial university, but the province maintains a normal college and an agricultural college, both at Truror. Dalhousie University, at Halifax, is the leading university of the Maritime or Atlantic provinces of Canada as they are also widely known. Among the leading denominational schools are St. Francis Xavier College at Antigonish, Acadia University (Baptist) at Wolfville, King's College (Anglican) at Windsor, and the Presbyterian (Theological) College at Halifax. Technical education has been greatly promoted by the Nova Scotia Technical College, which is affiliated with all the other colleges for the first two years of the technical courses.

The People. Although Nova Scotia was originally a French settlement, nearly

all of its present inhabitants are of British origin, the Scotch predominating.

Cape Breton and the eastern part of the peninsula are inhabited chiefly by descendants of Scotch settlers. Some French-Acadians are found in the western counties, particularly Yarmouth and Digby, and there is a sprinkling of Micmac Indians, the original inhabitants of the region. The population has not been increasing rapidly; it was 450,000 in 1891; 492,938 in 1911; and 523,837 in 1921.

History. Although explorers of several nations—Cabot, Cortereal, Verrazano, Cartier and others—explored the region in the fifteenth century, the history of Nova Scotia properly begins with the first settlement, on the island of Saint Croix, made by a company under the leadership of Sieur de Monts, Champlain and others. This settlement was begun in 1604. The next year the colony was moved to the mainland and named Port Royal. So long as the French retained possession of this region, Port Royal was its most important settlement.

In 1621 King James I granted to Sir William Alexander, a Scot, the entire territory known to the French as Acadie and to the English as Acadia. Alexander renamed it Nova Scotia. Port Royal was captured by English forces in 1628, but the entire province was restored to France in 1632. Except for the three years 1654-57, the French occupied Acadie undisturbed for nearly a century; but Port Royal was again taken by the English, and the subsequent Treaty of Utrecht gave the territory to them.

Louisburg, on Cape Breton Island, considered the strongest fortress in America, was captured by the English in 1745 and again in 1750.

It was in 1755 that the English deported many of the Acadians and scattered them in the English colonies to the south. Longfellow's *Evangeline* has done more than volumes of formal history to preserve the memory of this act.

With the deportation of the Acadians and the influx of new settlers from Great Britain, a need was felt for a government more closely modelled on English lines. A constitution was granted in 1758, and in 1763 Prince Edward Island and Cape Breton Island were added to the colony. Prince Edward Island, however, was made a separate colony in 1769. Cape Breton was allowed a government of its own from 1784 to 1819. After 1773 Nova Scotia received large numbers of Scotch immigrants, and after the Revolutionary War hundreds of United Empire Loyalists settled mainly in the extreme west.

Like all the Canadian colonies Nova Scotia went through a generation of struggle for self government. Responsible government was finally won in 1848 under the leadership of Joseph Howe. In 1867 Nova Scotia decided to join the Dominion of Canada, but soon repented of the bargain, and for a number of years tried to repudiate it. The opposition gradually declined, and was almost completely eliminated when the Intercolonial Railway was completed in 1876. In 1884 a Liberal ministry headed by William Stevens Fielding took office. Fielding remained premier for twelve years, and was succeeded by George Henry Murray, who was still in office in 1923. The broad outlines of Liberal policy throughout this period remained unchanged. The development of mining, fishing and agriculture, and in more recent years prohibition and educational problems, have been the chief concern of the government. The building of railways and highways was encouraged. In 1908 the one hundred and fifteenth anniversary of the founding of representative government in Nova Scotia was celebrated, and a memorial tower was afterwards built at Halifax. Strict prohibition was adopted in 1910, except for Halifax, and in 1916 the measure was extended to cover this city. During the World War, Halifax, as the chief naval station of the Dominion, was a scene of extraordinary activity. The terrible explosion in the harbor at Halifax on December 6, 1917, by the collision of the French munition steamer *Mount Blanc* with the Belgian Relief steamer *Imo,* caused the total destruction of 874 buildings, the partial destruction of 337 and the damaging over 5,000 others. Over 9,000 people were rendered homeless and 1,870 persons lost their lives.

STATISTICS. The following statistics are from the latest authentic sources:

Area, square miles	21,428
Population (1921)	523,837
Annual coal output	6,500,000
Production of pig iron	400,000
Total mineral output, value	$30,000,000
Hay and clover, tons	1,000,000
Oats, bushels	150,000
Miles of railway	1,500
Value of fish catch	$12,720,000
Members of Dominion House of Commons	16
Members in Dominion Senate	10
Members provincial assembly	43
Members legislative council	21

Novel. See FICTION.

November, the eleventh month of the year. It receives its name from the Latin *novem,* or nine. It was the ninth month of the old Roman year. It is one of the four months having thirty days. In Great Britain November is considered a gloomy, unattractive month in which fogs may be expected. In the United States and Canada November is a cheerful month. It precedes the winter season and follows a season of hard labor. The crops are safe. The ingathering of harvest and of fruits is celebrated by a national holiday. The month is associated in memory with autumn leaves, hunting, Indian summer, Thanksgiving, outdoor sports, and, in the north, with early skating. In Australia and Argentina, November is, of course, a spring month.

Noyes, Alfred (1880-), one of the foremost of contemporary English poets. In his earlier work Mr. Noyes made no effort to interpret the everyday life about him. This work was frankly optimistic. He expressed joy in things past, old-fashioned delights and a simple, pleasant fairyland. The chief of these works, which combine a fine manliness with a child-like vision, are *Tales of the Mermaid Tavern, Flower of Old Japan, The Loom of Years, Robin Hood,* and *The Forest of Wild Thyme.* In his more recent work, however, he no longer tries to avoid the great issues that stir the world. In *The Wine Press* and *A Belgian Christmas Eve,* he voices his protest against war. In none of Mr. Noyes' poetry is to be found the daring innovations in structure that characterize the ultra moderns. He was born at Staffordshire and was educated at Oxford. In 1913 he delivered at Lowell Institute, Boston, a course of lectures on *The Sea in English Poetry.* In the same year he was honored with the degree of Doctor of Letters by Yale University.

Nubia, a district of Africa extending along both sides of the Nile from Egypt to Abyssinia. It is a region rather than a country. It may be said to begin at the lower or first cataract of the Nile and to extend to the junction of the Blue and the White Nile. It is an indefinite part of that indefinite region called by the ancients Ethiopia. It contains a population of about 1,000,000 people, under the joint rule of Great Britain and Egypt. Nubia begins at the west at the confines of the Libyan Desert and extends eastward to the Red Sea. The Nubian Desert is between the Nile and the Red Sea. The Nile has but one tributary, Atbara, in Nubia. A vivid description of Nubia, taken in the narrow sense of the immediate valley of the Nile, is given by Conan Doyle:

> It is a singular country, this Nubia. Varying in breadth from a few miles to as many yards, it extends in a thin, green, palm-fringed strip upon either side of the broad, coffee-colored river. Beyond it there stretches on the Libyan bank a savage and illimitable desert, extending to the whole breadth of Africa. On the other side an equally desolate wilderness is bounded only by the distant Red Sea. Between these two huge and barren expanses Nubia writhes like a green sandworm along the course of the river. Here and there it disappears altogether, and the Nile runs between black and sun-cracked hills, with the orange drift-sand like glaciers in their valleys. Everywhere one sees traces of vanished races and submerged civilizations. Grotesque graves dot the hills or stand up against the skyline: pyramidal graves, tumulus graves, rock graves,—everywhere, graves. And, occasionally, as the boat rounds a rocky point, one sees a deserted city up above,—houses, walls, battlements, with the sun shining through the empty window squares.

Nuisance, a person or thing that annoys, injures or gives trouble to others, by being noxious, offensive or irritating. In a legal sense, the term nuisance is applied to such a use of property or such a course of conduct as, "irrespective of actual trespass against others or of malicious or actual criminal intent, transgresses the just restrictions upon use or conduct which the

proximity of other persons or property in civilized communities imposes upon what would otherwise be rightful freedom." Thus the keeping of a pig, or even of chickens, may be adjudged a nuisance upon complaint of neighbors who are annoyed thereby. Even the use of steam power, though on one's own premises and for a lawful purpose, may be a nuisance, if by reason of being in one of several closely-built dwellings the vibration and noise cause unreasonable injury to the adjacent property and occupants.

An obstruction to a highway or navigable river, if it seriously interferes with public traffic and is unauthorized by law, is a nuisance; but the temporary obstruction of a reasonable part of a highway for a legitimate purpose, such as the moving of a building or the deposit of materials for use in a new building or one under repairs, is not necessarily a nuisance. Decision as to what constitutes a nuisance depends upon the point at which the selfish use of an alleged right transcends the obligation to respect the rights of others.

A common nuisance, or public nuisance in the eyes of the law, is one which tends to the annoyance or injury of the public generally, and is therefore to be ended by forcible abatement or by an action by state or municipal authorities. It is distinguished from a private nuisance, or one which causes special injury to one or more individuals and therefore gives ground for a private suit at law, including a claim for damages as well as abatement. Thus, if one obstructs a highway, any person may remove the obstruction, but only the state, city, or other public authority can prosecute the offender, unless some particular individual suffers special injury. Thus, if any person is turned from his road and compelled to go another way by reason of the obstruction, and thereby suffers a specific pecuniary damage, the public nuisance becomes as to him a private nuisance, and he has the right to sue the proper authorities for damages.

Nullification, the doctrine of the sovereignty of the states; that is, the refusal of the states to accept federal control. It first became a vital factor in government in 1798, in connection with the Kentucky Resolutions of that year, when that state asserted the right on the part of individual states to interpret the Constitution for themselves. In 1832 the question was further agitated, when South Carolina attempted to put the theory into practice. The tariff acts were by her declared null and void. In the same year President Jackson interfered with the threatened action of the states. He declared in his annual message that nullification could never become a remedy for the troubles, and pleaded earnestly in behalf of the Union. Matters were temporarily settled in 1833, when Clay's Compromise Bill was signed by the president on March 2. Despite efforts to check their power, the States' Rights school of statesmen grew constantly stronger, and protests against federal control developed into the desire, in the South, for complete separation from the Union. On the right of nullification, then, were based the arguments of the South for secession. The question was not finally settled until the close of the Civil War. The subject gave rise to some of the most famous debates and speeches in Congress, and is inseparably linked with the names of Calhoun, Clay, Hayne, and Webster.

Number. See ARITHMETIC.

Nuns. See MONASTICISM; SISTERS OF CHARITY.

Nuremberg, a city of Bavaria. It is situated on both sides of the Pegnitz, about ninety miles northwest of Munich. It is an important city commercially, and is one of the most interesting towns in Germany. It is mentioned in history as early as 1050. It was one of the free towns of the empire. A massive stone wall, strengthened at intervals by towers, still encircles the city. It crosses the river on stone arches and is pierced by ten gates. A dry ditch one hundred feet wide and thirty-five feet deep follows the outside. Before the invention of gunpowder and the use of cannon the city was impregnable to any ordinary assault. The river within is spanned by several bridges. A suspension bridge is said to be the first structure of the kind in Europe. Greater pains have been taken to preserve the medieval features. Twelve smaller figures of church fathers

and prophets stand above these. Below are over seventy representatives of genii, mermaids, and animals. It is considered by the historian a gem of German art.

The public squares are small, as might be expected in so compact a city. There are a number of notable statues. The fountain known as the Schöne-Brunnen has the form of a Gothic pyramid sixty-three feet in height. It was executed 1385-96. It is adorned with statues of the seven electors of that time and with those of nine heroes: Charlemagne, Godfrey of Bouillon, Clovis, Judas Maccabaeus, Joshua, David, Caesar, Alexander, and Hector. Above these rise Moses and the seven prophets. It is considered the most artistic fountain in Europe. Another fountain, called the Goose Fountain, stands in the goose market. It represents a peasant with a goose under each arm. A stream of water pours from the bill of each goose. A monument of the war with France was erected in 1876.

A town library of 80,000 volumes contains priceless specimens of early printing, illustrated with the wooden cuts for which Nuremberg was famous. The house in which Dürer was born is marked by a suitable inscription. The Dürer house, in which he lived, has been converted into a museum. The city hall dates from 1616. There are several museums. The most noted is the Germanic Museum founded in 1852. It occupies an old Carthusian monastery. The basements or cloisters, extensive vaulted apartments, contain a complete collection of medieval tombstones and architectural ornaments. Effigies in stone, for which that period was noted, have been gathered here from many an old churchyard. Others are represented by casts. In the rooms above there are numerous interesting collections, including flint and bronze weapons, tools, and trinkets, specimens of tiling, Nuremberg stoves, locks with keys so heavy that one is all that a man would wish to carry, the original model of Luther's monument at Worms, and a complete collection of armor, firearms, and weapons. Possibly the most interesting, though by no means the most pleasing, object of interest in the city is the old burg or castle. This castle stands on a sandstone rock at the north end of the town. It was the original stronghold about which the city was built. A linden tree in the court is thought to have been planted by the wife of Emperor Henry II about 1024. It marks the spot where the emperor used to hold his court.

A pentagonal tower contains a collection of the horrible instruments of torture with which the city fathers used to extort information from supposed criminals. All the stories one may have read of medieval torture seem credible in the presence of iron boots for crushing the foot, pulleys for stretching the joints, racks for torturing the body, funnels for filling the body with water to the verge of bursting, braziers to be filled with hot coals on which to roast unfortunate victims, hot pincers for tearing the flesh, and other instruments too numerous and even horrid to mention. The famous Iron Maiden is kept here. It has the form of a draped female figure of large size. The front is composed of two doors that meet at the middle and are hinged at the sides. The prisoner destined to the embrace of the iron maiden was placed inside. As the doors closed spikes placed in them penetrated the eyes and heart of the unfortunate victim. A trap door is shown in the tower beneath which is a well of great depth. Sharpened bars, like scythes, were set in its walls, so that a victim cast in from above would be cut literally to pieces ere his body reached the river flowing far below.

The railroad stations are without the old walls. Large suburbs have grown up. The manufacturing establishments for which the city is noted are located in these suburbs. Printing, lithographing, typefounding, and bookbinding are important industries. There are manufactures also of toys, colors, clocks, watches, railway carriages, machinery, electrical apparatus, musical instruments, scientific apparatus, etc. Like other cities of Bavaria, Nuremberg is noted for its beer. The immense lead-pencil factories of the Fabers are located in a village six miles away. The toys of Nuremberg are chiefly such as boys delight in—metal soldiers, swords, railway trains, etc. The German rival in this line is Sonnenberg, a center for dolls and toys coveted by girls.

The first watches small enough for the pocket were made at Nuremberg.

Longfellow's poem of Nuremberg gives an excellent description of this quaint city.

See Toy; Durer; Sachs.

Nursery, in horticulture, an establishment for the rearing of plants, especially fruit trees. The following statistics are taken from the census report:

Number	4,049
Acreage	51,453
Value of products	$20,434,389

The following are the latest nursery statistics for the states:

State	No.
California	540
New York	359
Iowa	194
Texas	181
Michigan	170
Ohio	168
Pennsylvania	161
Illinois	155

For many years New York was the first state in number of nurseries and value of products, but California has forged ahead in this branch as in many other branches of the agricultural industry. See Grafting; Spraying; Burbank, Luther; Grape; Apple.

Nut, in common language, any hard shelled, oily fruit. Botanically, a nut is a hard, dry, one-seeded fruit, in which but one ovule has developed. The shell does not split on ripening. Walnuts, hickory nuts, acorns, cocoanuts, chestnuts, and hazelnuts are familiar botanical nuts. Peanuts, Brazil nuts, and almonds are not nuts in this sense of the word. Like the common grains, nuts remain sweet a long time if kept dry. Now that our native forests are so restricted in area, and our population has so increased, the autumn joy of gathering nuts for winter use and the winter pleasure of eating nuts of one's own gathering have become almost a matter of tradition; but commercially, and as articles of food, nuts are important. In 1921 the United States imported $36,501,682 worth of nuts. We import Brazil nuts, almonds, cocoanuts, walnuts, and filberts. We export hickory nuts, black walnuts, pecans, and chestnuts. Mexico ships fifty car loads of pecans to the United States yearly. Nuts contain water, starch, sugar and fat. Some people live almost entirely on nuts.

Nuthatch, a family of climbing birds akin to the chickadee. The name is derived from a custom of lodging a seed or a nut, usually a beechnut, in the bark of a tree and *hacking* or *hatching* it with repeated strokes of the bill. There are four species in North America. The white-breasted nuthatch nests from Minnesota to New Brunswick and southward. The red-breasted breeds from the same line northward and along the Alleghanies southward. These birds have somewhat the attitude of tiny woodpeckers, but they run down a tree trunk as readily as they run up, and make no use of the tail feathers for support. In fact, head down and tail up is a favorite, we may say usual, position. Nuthatches nest in trees or stumps.

> The busy nuthatch climbs his tree,
> Around the great bole spirally,
> Peeping into wrinkles gray,
> Under ruffled lichens gay,
> Lazily piping one sharp note
> From his silver mailéd throat.
> —Maurice Thompson.

With more artless inquisitiveness than fear, this lively little acrobat stops his hammering or hatching at your approach, and stretching himself out from the tree until it would seem he must fall off, he peers down at you, head downward, straight into your upturned opera-glass. If there is too much snow on the upper side of a branch watch how he runs along underneath it like a fly, busily tapping the bark, or adroitly breaking the decayed bits with his bill, as he stretches for the spider's eggs, larvae, etc., hidden there; yet somehow, between mouthfuls, managing to call out his cheery quank! quank! hank! hank!—Neltje Blanchan.

Then there is the white-breasted nuthatch; he is very sure to find the suet sooner or later. How different he is from downy! He always alights head downward, and feeds in that position on the tree. When he comes you will learn to put large pieces of food on the table. Anything that he can carry will be taken away, and tucked into the cracks and crotches of the trees. He is a tireless little worker.—Our Birds:—*The Nuthatch.*

Nutmeg, the seed kernel of the nutmeg tree. The tree is a native of the Malay Archipelago. It grows to a height of not to exceed twenty-five feet. The nutmeg has the general appearance of a pear tree. The flowers are like those of the lily of the valley in form and size, but they are of a pale yellow and are exceedingly fragrant. Hanging on the tree, the nutmeg is a hard-meated, yellow, candied, pear-like fruit which finally splits, exposing what corre-

sponds to the pit of a plum. Growing on one end of this pit or nut, and partly covering it, is a peculiar, bright red, netted appendage, which constitutes the mace of commerce. In countries where the nutmeg is raised the pulp is used for preserves. The nutmeg pits, as we may call them, are gathered, stripped of their outer covering, placed on gratings, and are dried at a slow heat until the kernel rattles in the shell. The shells are then broken open. The kernels are dipped in milk of lime to render them safe from the attacks of insects, as well as to prevent their sprouting. They are packed for export in tight casks, designed to prevent them from absorbing moisture. The nutmeg which the cook grates for seasoning purposes is, therefore, the meaty kernel found within the stone of a plum or peach-like fruit.

The original home of the nutmeg tree is a group of small islands known as the Spice Islands in the East Indies. These islands were at one time owned by the Dutch, who guarded their monopoly of nutmeg jealously. They forbade the exportation of seed, root, or slip. In 1796 the British seized the islands, and the cultivation of nutmegs was extended to India, Brazil, and the West India Islands.

Nutmegs are propagated by planting the entire fruit—pulp, pit, and kernel—in bamboo pots, that is to say, ends of bamboo joints having the size and shape of fruit cans. When large enough to set out, the joint is split, and the young plant, with its cylinder of dirt, is planted in a hole prepared for it. The nutmeg tree begins to bear at about eight years of age. In full bearing it produces about five pounds of nutmegs and one and one-half pounds of mace yearly. As in the case of most tropical fruits, ripe fruit may be found on the tree the year around. There are, however, three principal harvests,—one in July, when the fruit is abundant, but the mace thin; in November, when the mace is thick, but the nutmeg small; and in March when both nutmeg and mace reach the greatest perfection. Nutmegs, like pecans, are both wild and cultivated. The orchard nutmeg is plump and runs about seven to the ounce; the wild nutmeg is smaller and is less rich in oil and fragrance.

Singapore is the world's great market. About 1,500,000 pounds of nutmegs and 500,000 pounds of mace are marketed by the Singapore merchants annually.

The word nutmeg comes from the Latin, meaning *musk nut*. When the nutmeg was a rarity it was a fashionable perfume. For the sake of the scent English ladies had nutmegs set in silver, ornamented with pearls and precious stones, to hang from the belt. See SPICE.

Nutmeg State. See CONNECTICUT.

Nutrition. See FOOD.

Nux Vomica, a poisonous drug. It is obtained from the seed of a small tree native in Japan, Burma, Siam, Cochin China, and northern Australia. The branches bear ovate, strongly ribbed leaves and corymbs of greenish white flowers. The latter are succeeded by fruit having the size and shape of a small orange. The seeds have the size and shape of a nickel. They are covered with a coating of grayish green silky hair. Both fruit and seeds contain strychnine. They are exceedingly poisonous, but are eaten by the hornbill with apparent relish. The uses of nux vomica in medicine are the same as those of strychnine. See POISON.

Nyanza, nī-ăn′za, a word in the Bantu speech signifying great water. There are three of these large lakes in equatorial Africa. The Victoria Nyanza, 300 miles long, lies in a granitic valley and is eighty-two miles wide where it is crossed by the equator. The waters are fresh and sweet. It was discovered by Captain Speke in 1858, and was named by him for Queen Victoria. The Albert Edward Nyanza was named for her oldest son, the late King Edward. Albert Nyanza, another fine lake, was discovered by Samuel White Baker in 1864, and was named for Albert, the queen's consort. These three noble lakes are important reservoirs from which the main Nile receives much of its water. They lie in a fruitful country. Fortunately it is now rendered accessible by railroads on the Cape to Cairo route. See NILE; CAPE TO CAIRO.

Nydia, in Bulwer's *Last Days of Pompeii,* a blind flower girl. She is represented as having been stolen from her parents while an infant and sold to a hard taskmaster. She is rescued from slavery by the hero of the story.

Nye, Edgar Wilson (1850-1896), an American humorist. He was a native of Shirley, Maine, and died at Asheville, North Carolina. Mr. Nye was admitted to the bar in Wyoming, but removed to New York where he won reputation as a lecturer, and a writer under the pen-name of "Bill Nye." Among his best known books are *Forty Liars, Bill Nye and Boomerang, Fun, Wit, and Humor,* and *Remarks.* He was associated with James Whitcomb Riley both in authorship and on the platform. *Baled Hay* was a joint volume.

Nymphs, nĭmfs, in Greek mythology, inferior divinities in the form of beautiful maidens. They were ever young, and were in the train, or at least under the protection, of some higher divinity, as Venus, Diana, or Pan. They possessed the gift of foretelling future events, and the power of inspiring the poet. They were of several classes. The Naiads dwelt in rivers, brooks, and springs. They wore garlands of flowers and were lighthearted, musical, and kindly. Scott speaks of Ellen, in *The Lady of the Lake:*

> Like monument of Grecian art,
> In listening mood, she seemed to stand,
> The guardian Naiad of the strand.
> And ne'er did Grecian chisel trace
> A Nymph, a Naiad, or a Grace,
> Of finer form or lovelier face.

The Dryads lived in grass and trees. They danced around the old oak. The nymphs of the mountains, caves, and grottoes were called Oreads. The Nereids were the nymphs of the sea. The botanist calls the fragrant white water lily Nymphaea.

> Where were ye, Nymphs, when the remorseless deep
> Closed o'er the head of your loved Lycidas?
> —Milton, *Lycidas.*

Nyx, in Greek mythology, the goddess of darkness and night. She was the daughter of Chaos. She became the wife of Erebus, and the mother of Aether (Air) and Hemera (Day). She dwelt in Hades. The Roman name for Nyx was Nox.

O

Oak, a genus of cupbearing trees, rarely shrubs, of the north temperate zone and the countries of the tropics. There are over 200 species. The cup of the acorn is composed of numerous reduced leaves or bracts. The halves of the acorn are seed leaves. The acorn is an article of food for man and beast. Acorns and beechnuts are together called mast. Mast is a favorite food of the bear and razor-backed hog. The Indian of southwest California and Mexico collects acorns for food. The peasants of Italy make a black bread out of acorns. In France, prior to the French Revolution, the peasants in many sections were reduced to a diet of acorn bread.

Among the oaks are the cork oak, whose bark is used for corks, and the black oak, whose galls make good ink. The live oak, frequently laden with moss, bears evergreen leaves, and is best of all for shipbuilding. The bur oak is also called the mossy-cup oak by children. The white oak is the noblest oak of all. It is a handsome tree in summer when in full foliage. Its acorns are a never ending source of pleasure in autumn. It stands like a stout old giant in winter, and "when the white oak's leaves are as large as a squirrel's ear, it is time to plant corn." The elm for grace and beauty, but the old oak for qualities that endure. "Hearts of oak," "walls of oak," "strong as an oak," "stand like an oak," "the brave old oak," are expressions that show the estimate in which the oak is held.

Oakland, California, the county seat of Alameda County and the third city of the state, is six miles across San Francisco Bay from the city of San Francisco and 86 southwest of Sacramento. It is served by numerous lines of steamers and by the Southern Pacific, Western Pacific, Atchison, Topeka & Santa Fe and Oakland, Antioch & Eastern Electric railroads. It also has interurban electric service with many surrounding cities.

Parks, Buildings and Institutions. Oakland is one of the most beautiful cities in North America. It faces the bay and has for background a series of wooded hills. The city itself has been greatly beautified by man. There are more than thirty parks, the most popular being Lakeside Park. The latter surrounds Lake Merritt, a body of salt water with an area of 160 acres and a water connection with San Francisco Bay. The two most popular drives are Foothill Boulevard and Highland Drive.

Oakland is the seat of Saint Mary's College for Men, Mills College for Women, California College, a Chinese College and a number of private educational institutions. The public schools rival those of any city in the United States and are supplemented by an adequate library system. At Berkeley, not far distant, is the University of California. In the city is the State Industrial School of Mechanical Trades for the Adult Blind.

Notable buildings are the Carnegie library, Y. M. C. A. and Y. W. C. A., Masonic Temple, Claremont and Oakland hotels, and numerous office buildings, churches and hospitals. Many of the public buildings embody the most modern architectural features.

Industry and Commerce. Surrounding Oakland is a very rich agricultural region, for which the city is the outlet. Along the edge of the inner harbor are fruit-canning factories, jute and cordage mills, chemical works, printing and publishing establishments, marble-cutting plants, smelters, shipyards, flour and planing mills, windmill factories and metallurgical works. An extensive trade in the products of these establishments adds to the wealth of the city.

History. While this part of California was still a private Mexican land holding (1850) a "squatter" settlement was made. In 1852 the settlement was chartered as a town, and secured a city charter two years later. It was made the county seat in 1874. Oakland adopted the commission form of government in 1910, and since 1908 the municipality has controlled the wharves. The census of 1920 gave the city a population of 216,261.

Oasis. See Sahara.

Oates, ōts, **Titus** (1649-1705), an English impostor. Although the son of a Baptist minister, and himself educated for that sacred office, he appears to have been a man of vile character. He was turned out of a chaplaincy in the Parliamentary army. After receiving very severe punishment from the English government for furnishing false testimony which resulted in the execution of about thirty-five innocent Catholics, he regained his influence after the accession of William and Mary. He died July 12, 1705.

Oath, ōth, a solemn agreement, calling upon the name of the deity, to fulfill some promise, to tell the truth in court, or to discharge the duties of an office. The practice of taking an oath has its roots in the remotest antiquity. The jungleman of India places his hand on the skin of a tiger and calls upon the wild beast to devour him if he fails of his word. The modern Hindu passes his word above a basin of water from the sacred Ganges. The African negro swears by his head, his arm, or his leg, calling upon it to wither if he fail to keep his promise. The ancient Carthaginian took oath by the sun, moon, and stars; the Greek, by Zeus; the Roman, by Jupiter. The Shoshone Indian says "The earth hears me, the sun sees me; shall I lie?" The Chinese kill a chicken and swear by its dripping blood. The Siamese Buddhist not only calls down death upon himself, but desires that he may afterward be cast into hell to go through immortal tortures, among them to carry water over the flames in a wicker basket to assuage the thirst of the infernal judge, then that he may migrate into the body of a slave for as many years as there are grains of sand in four seas, and after this that he may be born a beast through five hundred generations. Joseph placed his hand under Jacob's thigh in the land of Goshen and promised to take him home to the burial place of his fathers. Agamemnon uplifted his hands, and took heaven to witness. The Danes took oath on the holy ring or bracelet to quit King Alfred's kingdom.

Although Christ said, "Swear not at all," it was the custom of the medieval Christians to take oath on the holy cross. The Scotch witness raises his right hand with, "I swear by God Almighty." The English witness closes his oath by kissing the Book, that is to say, a copy of the Holy Scriptures. Charlemagne took oath in Latin, "Sic me adjuvet Deus." The German says, "So mir Gott helfe;" the Anglo-Saxon, "So help me God."

The sovereign of Great Britain and Ireland takes oath to obey the laws passed by Parliament and to protect the Protestant religion. The president of the United States takes oath as follows: "I do solemnly swear that I will faithfully execute the office of President of the United States, and will, to the best of my ability, preserve, protect, and defend the Constitution of the United States." The witness on the stand swears to "tell the truth, the whole truth, and nothing but the truth." Quakers and others having religious scruples against the taking of an oath are permitted to make a solemn statement instead.

Oats, an important cereal. Oats are the seed of a grass cultivated in all temperate climates. Two or three species grow wild in North America. Oats do not ripen so far north as barley, nor do well so far south as corn, but can endure more rain and cloudy weather than either. It is thought that all varieties, black, white, smooth, and awned, are derived from a single wild grass of the Old World; at least it is difficult to make any other satisfactory disposition of the subject. Oats are divided into two great classes. In the spreading oats, the branches of the panicle extend in all directions from the central stem. In the second class, known as banner oats, the branchlets all hang on one side like the mane of a horse.

Oats are regarded as the best of all grains for work horses, especially in warm climates and during the summer anywhere. As compared with corn, oats give equal strength and go less to fat. An oat-fed horse perspires less and can stand more hard work. Oatmeal and rolled oats have long been a favorite food in Scotland and are now much in favor among English-speaking people generally, especially at the breakfast table.

Oats are one of the world's greatest crops. They are raised in all but the warmest parts

of Europe and are the chief grain crop north of a line drawn from Ireland to central Russia. Central Asia and Siberia contribute their share. Australia raises a large oat crop. Algeria and Cape Colony, at the extreme ends of Africa, export oats. In North America oats rank with wheat. So far as statistics show, few of the South American countries raise oats. Of the cereals, oat straw is the best substitute for hay. For this purpose, it should be cut before the grain is out of the dough.

Oats are raised in every state and territory. In ordinary years Iowa leads, with a production of over 100,000,000 bushels. Then comes Illinois with almost as many.

The following states are listed in the order of their output of oats: Iowa, Illinois, Wisconsin, Minnesota, Nebraska, Indiana, New York, Pennsylvania and Ohio. These localities almost always have a yield averaging over 1,000,000 bushels. Arizona, on account of the small area as yet irrigated, and Rhode Island and Delaware for other reasons, are at the foot of the list.

The total oat crop of the United States for 1921 was 1,060,737,000 bushels. The following figures were given out by the United States Department of Agriculture as the American oat crop for 1921:

State	Bushels
Maine	4,340,000
New Hampshire	630,000
Vermont	2,673,000
Massachusetts	279.000
Rhode Island	28,000
Connecticut	330,000
New York	24,912,000
New Jersey	1,728 000
Pennsylvania	35,283,000
Delaware	168,000
Maryland	1,620,000
Virginia	3,342,000
W. Virginia	4,620,000
N. Carolina	3,060,000
S. Carolina	8,112,000
Georgia	8,652,000
Florida	533.000
Ohio	37,122.000
Indiana	45.072,000
Illinois	121,741,000
Michigan	28,101,000
Wisconsin	63,958 000
Minnesota	94,176,000
Iowa	154,960,000
Missouri	42,960,000
N. Dakota	49,761,000
S. Dakota	58,300,000
Nebraska	70,054,000
Kansas	38,827,000
Kentucky	5,567,000
Tennessee	5,330,000
Alabama	6,776,000
Mississippi	2,940,000
Louisiana	1,265,000
Texas	33,570,000
Oklahoma	35,300,000
Arkansas	6,600,000
Montana	10,787,000
Wyoming	4,500,000
Colorado	6,727,000
New Mexico	1,690,000
Arizona	630,000
Utah	2,876,000
Nevada	113,000
Idaho	7,740,000
Washington	10,500,000
Oregon	8,704,000
California	3,780,000
United States	1,060,737,000

The oat crop for the world for 1921 was divided chiefly among the following countries:

United States	1,060,737,000
Canada	426,232,000
Argentina	47,606,000
Chile	2,715,000
Uruguay	1,986,000
Czecho-Slovakia	72,351,000
Belgium	30,251,000
Bulgaria	11,271,000
Denmark	52,016,000
Finland	28,029,000
France	245,206,000
Germany	324,880,000
Greece	4,134,000
Hungary	20,140,000
Italy	37,774,000
Netherlands	21,289,000
Norway	12,742,000
Poland	149,788,000
Jugoslavia	25,600,000
Spain	40,035.000
Sweden	67,585,000
Switzerland	3,036,000
United kingdom	183,146,000
Algeria	11,412,000
Tunis	5,167,000
Union of South Africa	7,789,000
New Zealand	5,225,000

Oat meal, rolled oats, and other preparations of this grain are familiar to the American people as breakfast foods. They are inexpensive and nutritious and constitute a desirable food for winter. However, since its food value is about 1,860 calories per pound, oats should not be used as a food during summer. It has twice the value of veal and a third greater value than the best beef as a heat producer.

Obelisk, a kind of stone monument peculiar to Egypt. It consisted of a single piece of red granite from the quarry of Syene in upper Egypt. Egyptian obelisks vary from a few feet to sixty-six feet in height. They are usually square in section and taper upward gradually, terminating in a pyramidal cap. They were chiseled from the solid rock. Three faces, that is to say, the top and two sides, were polished as the block lay in position in the quarry. Holes were then drilled and plugs of wood were driven in. These pieces of wood, upon being moistened repeatedly, swelled and acted like wedges, splitting off the stone its entire length without breaking it. The fourth side was then finished. The obelisk was conveyed down the Nile on a raft during the period of high water or else it was conveyed on a rude log cart dragged by men. Upon reaching their destination, the obelisks were inscribed with the facts of Egyptian history or the exploits of the Pharaohs. The letters of the inscriptions are in columns, reading from top to bottom instead of crosswise. Many of these obelisks were erected at Thebes. The largest were set up at Heliopolis. The list includes about forty. A number were transported to Rome; one stands on the embankment in London. A similar, indeed a companion, monolith, known as Cleopatra's Needle, was conveyed from Alexandria, Egypt, to Central Park, New York, and set up in 1880. The Washington Monument at Washington, D. C., and the Bunker Hill Monument have the obelisk form. They are composed, however, of regular courses of masonry. See CENTRAL PARK; CLEOPATRA'S NEEDLES.

Oberammergau, a village in the district of Ammergau on the river Ammer in upper Bavaria. Its inhabitants are an industrious people, occupied largely with the making of crucifixes, figures of saints, and toys. The village is noted for its presentation once in ten years of the Passion Play. See PASSION PLAY.

Oberlin College, an institution of learning at Oberlin, Ohio. It was founded in 1833 as Oberlin Collegiate Institute. The name was changed to Oberlin College in 1850. A collegiate department and a theological seminary are maintained. Oberlin admits both men and women. It claims, in fact, to have been the first coeducational college. Colored students were admitted from the first, but they have never attended in large numbers. The village of Oberlin was headquarters for the "Underground Railway." It was a violent Abolitionist center. In addition to the usual collegiate course there are departments of music and art. Much attention is paid to physical training. A summer school is maintained. In 1922 there were 163 instructors and 1,758 students; a large number of the latter were women. The library contains about 222,000 bound and unbound volumes. The latest figures available give $2,954,526 as the productive funds of this institution and the income from this amount was $142,725.

See UNDERGROUND RAILWAY.

Oberon, ō′be-ron, in medieval mythology, the king of the fairies. He appears in the legends of King Arthur, where he is represented as the son of Morgan le Fay. Shakespeare introduces Oberon into his comedy, *A Midsummer Night's Dream.*

Obi, ō′bē, a great river of western Siberia. Its sources lie in the Altai Mountains. The general course is northerly. It empties into the Gulf of Obi. Its lower course is frozen solid during the winter season. The Obi drains a basin of 920,000 square miles. In this respect it is the fifth river in the world. With its branches it has 9,000 miles of navigable waters. Though there are but few steamers at present, geographers expect that the river will one day be of great commercial importance, and that the valley will then become one of the great food-producing regions of the world.

Oboe, ō′boi or o′bō-ō, a wind instrument used in orchestra. It is about twenty inches long, shaped like a clarionet, and consists of a brass mouthpiece, three rosewood or mahogany sections through which runs a double vibrating reed, and keys to produce the different tones. A has come to be the standard pitch of the oboe. It has a high clear note, and is important as an orchestra instrument. See ORCHESTRA.

Obolus, or **Obul,** a small Greek coin. The name is thought to be akin to a word signifying a spit, and may have originated

in a very probable use of copper or iron nails by the primitive Greeks as money. The Attic obolus was a silver coin, the sixth part of a drachma in value and weight. It weighed eleven and one-fourth grains and contained about one thirty-sixth as much silver as our standard dollar. The obolus of Aegina was heavier; that current in Asia Minor weighed but nine grains. The Attic obolus was a rude looking coin about three-eighths of an inch in diameter; it bore a face in profile on the obverse, and the owl, bird of Minerva, on the reverse. The obolus plays much the same part in Greek literature and proverb that penny plays in English literature. An obolus was placed in the mouth of a corpse before burial to pay the fee of Charon, ferryman across the river of Hades.

Observatory, a place or building set apart for the observation of natural phenomena, as an astronomical observatory, or a meteorological observatory. An astronomical observatory requires to be situated where it may be as free from tremors of the earth as possible. A site should not be chosen near a busy railway line. An unobstructed view is required. For this reason a site is chosen away from the smoke of a large city. An elevated position, as the summit of a mountain affording a clear atmosphere and a free horizon is desirable.

The earliest observatory accorded the name was established by the Greeks at Alexandria about 300 B. C. Hipparchus, the father of astronomy, and Ptolemy, the geographer, did their work here. The Arabians founded observatories at Bagdad and at Cairo prior to 1000 B. C. A notable observatory was established by the Mongol khans in northwestern Persia about 1260. Another was founded at Samarkand. The noted telescope of Pekin was mounted on an elevated granite platform and was surrounded by an iron railing about 1300.

The earliest observatory in Europe was established by a wealthy merchant at Nuremberg in 1472. Nuremberg was not the first center of astronomical observations, but it was the first European city to have an observatory. Tycho Brahe established an observatory on the Danish island of Huen in 1576. The impulse given by this astronomer to long and patient research work led to the rapid establishment of other observatories.

The establishment of astronomy at Leyden and Dantzic led to the founding of the royal observatories at Paris and at Greenwich. About the middle of the eighteenth century the observatory was recognized generally as an important part of a university. The *Britannica* devotes several pages to the briefest mention of European observatories. Greenwich, founded in 1675, is by far the most noted, not so much for original work perhaps, as for the reason that the meridian of Greenwich has been adopted by most nations as the principal meridian from which longitude is reckoned.

The Pulkowa observatory, built by Czar Nicholas in 1835-9, enjoyed the distinction for thirty years of possessing the greatest refracting telescope in the world. This instrument had a fifteen inch aperture. It was replaced in 1885 by a thirty-inch refractor made by the Clarks of Cambridgeport, Massachusetts.

The first requirement of an astronomical observatory is a telescope. The building is designed to shelter this instrument and the attendants. In a modern observatory the telescope is mounted under a rotating dome, forming a storm-proof shelter. Observations are made through a slit or a whole side, as may be required. The telescope is provided with clockwork that shifts the direction of the telescope toward the west as rapidly as the earth turns toward the east. Once focused on a point in the heavens the clockwork keeps the instrument trained on the identical spot until it sinks beneath the horizon. Provision is made also for other instruments, including a meridian circle, minor telescopes, a sidereal clock, a chronometer, a spectroscope, apparatus for solar and stellar photography, etc. Convenient apartments are required for reference books, storage, and study.

The observatory of Yale was opened in 1830; that of Harvard in 1839. The United States Naval Observatory in Washington was organized in 1842. Noted American observatories are the Lick of the University of California, situated on Mount Hamilton, 4,250 feet above sea level, and the Yerkes of the University of Chicago, situated at Williams Bay. Lick has a

Lick observatory, Mount Hamilton, California.

Observatory at Nice, France.

ASTRONOMICAL OBSERVATORIES.

thirty-six-inch refractor and Yerkes has a refracting telescope of forty-inch aperture.

One of the most complete observatories in America is on Mount Wilson, near Los Angeles, California. . Its equipment includes a large reflecting telescope.

See TELESCOPE.

Oceanus, in classical mythology, one of the Titans, son of Saturn and Rhea. He was first ruler of the ocean, but after Zeus' war with the Titans, he was obliged to yield to Poseidon.

Ocelot, ō′sē-lŏt, an American animal of the leopard kind. It is, in fact, a small leopard about four feet in length from the nose to the extremity of the tail. It is a grayish animal marked with black-edged, fawn-colored spots. The under parts are whitish, more or less marked with black. The tail is half ringed with black. The ocelot ranges from Louisiana to Central America. It preys chiefly on birds. The name is Mexican. It is seen frequently about Mexican farmhouses in a semi-domesticated condition. It has the reputation and the faithless disposition of the domestic cat.

Ochre, a pigment consisting of clay, colored to varying shades of yellow and orange by oxides of iron. The red oxide gives red ochre, while the hydrated oxides produce the yellow, the more common. This is widely used in paints, particularly in the "priming," or first coat. Sienna and umber are varieties. When burnt they become deepened in color. Ochre is extensively found, Pennsylvania and Georgia leading among the states.

O'Connell, Daniel (1775-1847), an Irish orator and parliamentarian. He was born in County Kerry, Ireland, and died at Genoa, Italy. He was educated chiefly at the Catholic college of Douay, France, and entered upon the practice of law in Dublin. He was a man of fiery eloquence. He won a reputation in 1800 as an opponent of the union of the Irish Parliament with that of England. He led a movement for the admission of Catholics to Parliament, from which they were debarred by being required to take an oath that no conscientious Catholic could accept. In 1824 he formed the famous Catholic Association. Four years later he stood for Parliament and was elected. The fact that a man of such ability and character was debarred from taking his seat by the nature of the oath required drew public attention to the unfitness of the requirement, and did much to secure its abolition. In 1829 the Catholic Emancipation Bill, as it is called, was passed, and O'Connell took his place in Parliament. He became at once the Irish leader in the House. In 1842 he started an agitation for the repeal of the act of union between Ireland and England. He was arrested on charge of treason. He was sentenced to imprisonment, but the House of Lords refused to allow the sentence to be carried into execution. About this time a new party of younger men arose in favor of violent measures for the relief of Ireland. O'Connell was a man of oratory, a believer in moral suasion. He could not go with the young men. He fell between the party of violence and the party satisfied with things as they were, and so lost his leadership. The disappointments of life broke him down. He went to Italy for his health and died there. His reputation is that of a man of integrity and patriotism. His name is one commanding respect. He is greatly beloved by the Irish people. A statue in his honor is one of the public ornaments of Dublin.

O'Connell, William Henry, a cardinal of the Roman Catholic church. He was born at Lowell, Massachusetts, in 1859 and educated at Boston College and American College at Rome. He was ordained priest at Rome in 1884, and consecrated bishop in 1901. In 1905 he was named special papal envoy to the Emperor of Japan and was given Grand Cordon of the Sacred Treasure by the Mikado. He succeeded to the see of Boston in 1907 and was elevated to the cardinalate in 1911. He resides in Boston.

Octave Thanet. See FRENCH, ALICE.

Octavius. See AUGUSTUS.

October, the tenth month of the year. The name is derived from the Latin *octo,* meaning eight. October was the eighth month of the Roman year. October has thirty-one days. In America it is the month of typical autumn weather, the month of gorgeous foliage. The American boy holds October in affectionate remembrance as the month of nuts.

Octoroon. See MULATTO.

Octopus, or **Devil-Fish,** a marine mollusk of the cuttlefish order. Octopus signifies having eight feet. An oval, jelly-like, warty body, about a foot in length, terminates in a head surrounded by eight arms or tentacles, connected at their bases by a sort of web, in the midst of which is situated the creature's beak. The eye of the octopus is large and fierce and is calculated for twilight activity. The tentacles are long and whip-like. The animal walks upside down on them, holding its body up from the bottom of the sea with ease. Each of these arms is provided with 120 pairs of sucker-like disks, with which they may lay hold of food and convey it to the beak-like mouth. Once an octopus lays hold of an object the harder the object struggles to get away, the firmer the suckers hold. They are constructed on the principle of a boy's leather sucker, a disk of flexible leather carried by a string at its center. If the center of the disk be raised ever so slightly after it has been applied to an object, a vacuum is formed between the disk and the object. Atmospheric pressure, or suction, then holds the sucker to the surface of the object. A sailor attacked by an octopus would find it necessary, if once seized, to drag the animal after him or cut off its tentacles. All stories to the contrary, there is no well authenticated case of a person intentionally attacked by an octopus. A Pacific coast octopus has a body several feet long and a total diameter spread of twenty-eight feet, which would give tentacles of half that length. Like the cuttlefish the octopus ejects a black ink, under cover of which it may make its escape. This ink is used for sepia.

Octroi, ök-trwä′, a local tax imposed on goods entering a city or district. An octroi may be defined as a city or local tariff, with this difference, that it is designed for revenue only. It is not intended to keep goods out. The word is French. The custom is also French rather than Germanic. As late as 1900 an octroi was imposed by 1,500 French cities and towns. The most noted instance is that of Paris. Coal, for instance, on entering the city must pay a gate duty of $1.38 per ton. This brings a revenue of over $2,000,000 a year, but it keeps big factories outside of the city gates. The Paris octroi on alcohol is $3 a gallon, and brings in a revenue of $5,000,000 a year. Oil sells for seven cents a gallon less outside of the city walls than within the gates. Other articles paying the octroi are vinegar, fowls, eggs, dairy products, fish, game, meat, vegetables, fruits, and fuel of all sorts. In the early morning, when gardeners are bringing their produce to the city markets, long lines of carts wait at the gates, while the officials measure and estimate and collect payment of octroi. The octroi tax gives rise to smuggling. It is a nuisance—an obstruction to business that would not be tolerated in any but an Old World city. It is akin to the road and bridge tolls and other devices for raising money tolerated by slow-going people. Historically, an octroi was imposed by Athens. Rome was not free from a gate tax. The octroi was abolished very generally in Belgium in 1860; Holland, 1865; Spain, 1869; and Germany, 1875. See PARIS.

Odd Fellows, a secret order devoted to good fellowship and benevolence. The three links is the well known emblem. The order originated among the workmen of England, where a lodge is known to have existed as early as 1745. The first American lodge, five members, was instituted in New York, December 26, 1806. Lodges were established at Boston in 1818 and in Baltimore in 1819. As early as 1815 there were two lodges in Halifax. The order was opposed at first as British and un-American. The Rebekah lodges, established largely through the efforts and influence of Vice President Schuyler Colfax, are an auxiliary order of the wives and daughters of Odd Fellows with a membership of one-half a million. Less than four per cent of the total membership of the Odd Fellows is found outside of North America. In the appended table the reader will find the latest available statistical information regarding this organization:

ODD FELLOWS' STATISTICS

Lodges	17,010
Encampments	3,578
Rebekah lodges	9,900
Total membership	2,676,582
Relief paid in 1921	$7,660,354

Ode, a lyric poem characterized by exalted emotion, dignity of style, and an irregular form. The word ode is from the Greek and, in its original use, meant simply a song. In its more modern meaning, an ode, while classed with lyric poetry, is seldom sung or written to be sung. Its varied rhythm is, however, designed to express that fervor of emotion which would naturally find utterance in spontaneous song. Among the most notable odes in literature are Dryden's *Ode for St. Cecilia's Day,* Shelley's *Ode to a Skylark,* and Lowell's *Commemoration Ode.*

Oder, one of the most important rivers of Germany, rises in Moravia, near Olmütz, flows northwestwardly for 562 miles, and empties into the Baltic Sea. The river is in general shallow, but it has been rendered navigable by means of extensive levees, dams, etc. Near the sea it divides into parallel arms to form a wide delta, and at the point of contact with the Baltic the arms number three. Almost equal in size to the Oder is its principal affluent, the Warthe. Above Frankfort the Oder is connected with the Spree by the Kiel Canal (which see). The chief towns on the Oder are Stettin, Frankfort, Breslau and Oppeln.

Odessa, an important seaport of Ukraine. In size it is the fourth city of the country, ranking next to Warsaw. Population, about half a million. Odessa is situated on the shore of a semi-circular bay at the northwestern angle of the Black Sea, midway between the mouth of Dnieper and the Dniester. As neither of these rivers affords anchorage for large ships, Odessa is the metropolis of the vast region drained by them. The harbor is about thirty feet deep. It has been improved by the construction of immense moles. During the midwinter the bay is likely to be closed for about three weeks by ice. Of late years ice breakers have been depended upon to keep the harbor open.

Odessa stands upon a chalky terrace about 100 feet above the sea. The sidewalks reach the general level by a stairway of 200 steps. The harbor is exposed to terrific storms. Odessa is the chief wheat-exporting seaport of Russia. Mammoth elevators line the harbor. Beans, peas, oil cake, beet sugar, lumber, flour, and fish products are exported also. The chief imports are those needed by an agricultural district, as agricultural implements, machinery, groceries, fruits, and coal. Baled cotton and jute are imported for the consumption of local mills. There are extensive tobacco factories, soap works, and tanneries. The city is noted for breweries and sugar refineries.

Odessa occupies the site of an ancient Greek settlement. It is a city of importance to the Greek Church. It is regarded as a strategic point by the Russians.

Odin, ō′dĭn, in northern mythology, the ruler of the earth. In partnership with two brothers, he made the earth and the mountains and the heavens. Odin regulated the periods of day and night and established the seasons. He gave life and soul to man. He dwells in Asgard, a city of golden and silver palaces. His own palace is Gladsheim, home of gladness. Valhalla is his banquet hall. He sits on a throne holding a spear, the scepter of the world. Two wolves lie at his feet. A pair of familiar ravens, Thought and Memory, perch on the back of his chair, one at each shoulder. They fly to all parts of the world and bring tidings of what man is doing. The hall is filled with heroes who love to fight and feast. In the morning they go out to hack and hew each other. At evening, they return to the hall to feast. Their wounds are made whole. When Odin himself goes forth he rides upon his horse Sleipnir. Sleipnir has eight feet. He uses four for traveling like other horses. When he is weary Odin turns him over and he travels on his other four feet. Each day Odin sends his messengers, warlike virgins with helmets, shields, and spears, to bring to Valhalla the souls of mortals who have distinguished themselves in fight. When these messengers, the Valkyrior, ride forth, the northern sky is filled with a flickering light which mortals call Aurora Borealis. Odin is the father of Thor, the Thunderer. Odin is identical with Woden of the Saxons and Wuotan of the Old High Germans. See WEDNESDAY; MYTHOLOGY, SCANDINAVIAN.

Odoacer, ō-do-ā′ser (434?-493), the first barbarian ruler of Italy. He appears to have been born in the region of the mid-

dle Danube about 434. His ancestry is uncertain. At all events, he was a leader of influence among certain German tribes. He was enrolled in the Roman army when a young man. In 476 he took advantage of dissatisfaction among the hired troops of Rome. He placed himself at their head and organized a revolt. He deposed the last emperor of the west and took the reins of the government in his own hands. He assumed the title of Patrician, and, as such, acknowledged nominal allegiance to the emperor of the east resident at Constantinople. He was overthrown by Theodoric and was treacherously slain March 5, 493.

Odysseus. See ULYSSES.

Odyssey. See ILIAD AND ODYSSEY.

Oedipus, ĕd'i-pus, in Grecian legend, a prince of Thebes. He was the son of King Laius and his wife Jocasta. Laius, having been informed that his son would put him to death, caused the child's feet to be fastened together by thrusting a pin through them, and ordered him exposed on the mountain to die. A herdsman, to whom the unwelcome task was committed, took compassion on the infant and gave him into the care of a shepherd who belonged to the household of the king of Corinth. Through the schemes of the shepherd, the young man was adopted by the Corinthian king and grew up to regard himself as heir to the crown. He was called Oedipus, which means swollen foot, from the condition of his feet when brought to the king. Being taunted with low birth, he consulted the oracle at Delphi. The only answer received was that he was fated to slay his father and marry his mother. To avoid such a course he left his supposed father and mother at Corinth and set out for Thebes. On the way he met his real father in a chariot accompanied by servants. He was ordered roughly to get out of the road and in a scuffle that followed he slew his father, Laius, as had been foretold. In the course of his journey he came to Thebes. He found the city harassed by a monster called the Sphinx. Creon, the brother of Laius, the uncle of the stranger Oedipus, offered the hand of the widowed Jocasta, the young man's mother, as well as the throne itself, to anyone who would slay the sphinx. The sphinx was a monster who crouched on a rock and propounded a riddle to every traveler who passed. If he solved the riddle the traveler might go on in safety; if he failed, he was put to death. So far all had been slain. Oedipus sought the sphinx and listened to the riddle.

> Tell me, what animal is that
> Which has four feet at morning bright,
> Has two at noon, and three at night?

Oedipus at once replied, "Man, who in infancy creeps on hands and knees, in manhood walks erect, and in old age uses a staff." The sphinx, overwhelmed with mortification, cast herself from the rock and perished. Having thus fulfilled the conditions, Oedipus married his mother Jocasta and was made king of Thebes. At the end, a pestilence was sent upon the land. It was then made known by an oracle that Oedipus had slain his father. Jocasta hanged herself. Oedipus, the unfortunate and innocent victim of circumstance, went forth a wanderer, led by the hand of his faithful daughter Antigone. Reaching Athens he entered a sacred grove in which he was called without pain or struggle to another world. The tragic story of Oedipus, the man of misfortune, the toy of fate, was made the subject of three plays by the Greek tragedian, Sophocles: *Oedipus Tyrannus, Oedipus at Colonus,* and *Antigone.* The theme has been worked over by French and English tragedians. See SPHINX.

Oenone, in Greek legend, a nymph who became the wife of Paris before he was called upon to award the golden apple to the "fairest," and thus led to the fatal union with Helen. Tennyson has given the title of Oenone to a poem in which the deserted wife tells the story of the judgment of Paris.

> Hither came at noon
> Mournful Oenone, wandering forlorn
> Of Paris, once her playmate on the hills.
> Her cheek had lost the rose, and round her neck
> Floated her hair, or seemed to float in rest.
> She, leaning on a fragment twined with vine,
> Sang to the stillness, till the mountain-shade
> Sloped downward to her seat from the upper cliff.
> —Tennyson.

Oersted, ör'stĕd, **Hans Christian** (1777-1851), a professor of physics in the Danish University at Copenhagen. He was noted as a student of magnetism, galvanism, and electricity. His investigations did much to

establish the belief that they are but manifestations of the same form of energy. He invented a piece of apparatus designed to show that the magnetic needle, suspended freely, tends to place itself at right angles to the direction of an electric current in its vicinity. It is known to students as Oersted's Apparatus.

Officers' Reserve Corps, a component of the army of the United States, under the terms of the National Defense Act as amended by the Act approved September 22, 1922, "for the purpose of providing a reserve of officers available for military service when needed." The act provides for an officers' reserve corps consisting of general officers, of sections corresponding to the various branches of the regular army, and of such additional sections as the President of the United States may specify. The grades in each section and the number in each grade are prescribed by the President. Reserve officers are appointed and commissioned by the President alone, except general officers, who are appointed by the President with the advice and consent of the Senate. Appointment in every case is for a period of five years, but an appointment in force at the outbreak of war or made in time of war continues in force until six months after termination of the war. Any reserve officer may be discharged at any time in the discretion of the President.

In time of peace a reserve officer must be, at the time of his appointment, a citizen of the United States, between the ages of 21 and 60 years. Any person who was an officer of the army at any time between April 6, 1917, and June 30, 1919, or an officer of the regular army at any time, may be appointed as a reserve officer in the highest grade which he held in the army, or any lower grade. Any person commissioned in the national guard and recognized as a national guard officer by the Secretary of War may be appointed as a reserve officer in the grade held by him in the national guard. No other person shall in time of peace be originally appointed as a reserve officer in the infantry, cavalry, field artillery, coast artillery or air service in a grade above that of second lieutenant.

The President may order reserve officers to active duty at any time and for any period, to the extent provided for from time to time by appropriations for this specific purpose; but except in time of a national emergency expressly declared by Congress, no reserve officer shall be employed on active duty for more than fifteen days in any calendar year without his own consent. When on active duty a reserve officer receives the pay and allowance of his grade as provided by an act approved June 10, 1922, and mileage for the travel directed, but he is not entitled to retirement or retired pay. See Reserve Officers' Training Corps.

Ogden, Utah, the county seat of Weber County, and the second city in the state, is situated at the junction of the Ogden and Weber rivers, 16 miles east of Great Salt Lake and 36 miles north of Salt Lake City. It is on the Oregon Short Line, Southern Pacific, Denver & Rio Grande and Union Pacific railroads, and has interurban electric railway connection with Salt Lake City, Logan and other Utah cities.

Situated at the base of the Wasatch Mountains, Ogden is surrounded by scenic beauty. Ogden Cañon begins at the city limits; in this canyon are a waterfall and many other interesting sights. The city is well laid out with broad, paved streets that are lined with handsome public and private buildings. The most notable of these are the Carnegie library, post office, court house, Dee Hospital, State Industrial School, state institutions for the deaf, dumb and blind, Masonic Temple, Elks' Home and the Federal building. There are several parks, the most popular of which are Lester, Liberty and Union. Ogden is the seat of Sacred Heart Academy and Weber Junior College. It has four junior high schools and one senior high school.

Ogden lies in the heart of a prosperous agricultural and stock raising district, for which it is at once the distributing point and source of supply. The city has a large trade in beet sugar, grain, canned goods and fruit. Hydro-electric power is furnished to manufactories of cement, cereal foods, abattoir products, cans, beet sugar, clothing, brooms, bricks and tile.

The first settlement was made here in 1848, and a city was laid out under the direction of Brigham Young in 1850 and was chartered a year later; in 1861 it was rechartered. Ogden is now governed by a commission. In 1920 the inhabitants numbered 32,804.

Ogdensburg, N. Y., a port of entry, is on the St. Lawrence River at the point where it receives the waters of the Oswegatchie, and is opposite Prescott, Ontario. It is connected with the Canadian city by steam ferry and is served by the Rutland and New York Central & Hudson River railroads.

Ogdensburg is the home port of several fleets of steamers, and has a large wholesale trade in lumber, grain and general produce. There are industrial plants making silk, flour, leather goods, brass ware, gloves and lumber mill and machine shop products. Many of the city's factories use hydro-electric and water power, which are generated by the St. Lawrence River, Oswegatchie River and Hannawa Falls.

This city is the seat of St. Mary's Academy and the Ogdensburg Free Academy, and has modern primary and secondary schools. The St. Lawrence State Hospital, a large hospital for the insane, is located here. Notable among the city's buildings are the town hall, Federal building, state armory and a Catholic cathedral. Ogdensburg had a population of 14,609 in 1920.

Oglethorpe, ō′g'l-thorp, **James Edward** (1696-1785), an English soldier. He was a native of London and served with distinction in various wars. In 1722 he became a member of Parliament. He called the attention of Parliament to the harsh methods pursued by the English in the treatment of debtors. He thought it a better plan to release them and send them to the New World, where they might have an opportunity to make homes for themselves. In 1732 he and a few associates received a grant of a tract of land along the Savannah River. In the following year he came in person to America with a party of these colonists. He landed at Charleston. He aimed not only to relieve oppressed debtors, but the Protestants of Europe. A number of Huguenots from France were induced by him to try their fortunes in the new colony. He acted as governor of Georgia for ten years. He made an effort to conciliate the Cherokees and attach them to the English. He conducted a siege, unsuccessfully however, of the Spanish city of St. Augustine. On his return to England he was criticized for failing to root out the Spaniards, but later was rewarded for his services by a high position in the English army.

See GEORGIA; SAVANNAH.

O'Hara, Theodore (1820-1867), an American soldier, journalist, and poet. He was born at Danville, Kentucky. He was educated for the profession of law, but held a position in the United States Treasury Department and went to the Mexican war as a captain. He went with Walker on his adventurous Central American expedition. On his return he engaged in journalism, editing the *Mobile Register,* and other papers. During the Civil War he served on the staff of Albert Sidney Johnston and later with John C. Breckenridge. After the war he settled on a plantation in Alabama, where he died in 1867. A few years later the legislature of Kentucky ordered his remains brought back at public expense and interred in the state cemetery at Frankfort. O'Hara was a brilliant writer, but he has not left a large amount of permanent literature. Two poems are remembered, *A Dirge for the Brave Old Pioneer,* and *The Bivouac of the Dead.* The latter was written to commemorate the death of his comrades in the Mexican War, and was read by him on the occasion of their burial at Frankfort in the cemetery where he himself rests. The opening stanza, which we give, is inscribed on the gateway of the national cemetery at Arlington where thousands of unknown heroes lie buried. The lines seem equally appropriate above the wearers of the gray who rest in the cemetery at New Orleans.

The muffled drum's sad roll has beat
The soldier's last tattoo;
No more on life's parade shall meet
That brave and fallen few.
On Fame's eternal camping-ground
Their silent tents are spread,
But Glory guards, with solemn round,
The bivouac of the dead.

O. Henry (1867-1910), the pen name of William Sydney Porter, one of the best known and best loved of American fiction writers. He was born at Greensboro, S. C., and received an academic education in Texas. O. Henry began his journalistic career in Texas after working on a ranch for some years. His first position was that of a reporter for the Houston *Post*. Soon afterward he bought *Brann's Iconoclast,* renamed it *The Rolling Stone*, and worked mightily to make it succeed, furnishing almost all the copy himself. It failed. O. Henry then went to Central America and there gathered a wealth of material for his later stories. He remained in obscurity until 1901 the year of his removal to New York City. In a few years he was one of America's most popular short story writers, and it is upon his stories of life in the metropolis that his fame must ultimately rest. He employed cleverly the current slang of New York, and especially of the East Side. His insight into and sympathy with the lives of the poor won him an enormous circle of admirers. Millionaire and pauper, business man and thief—he knew and wrote about these in a fresh, vivid style. About 200 short stories came from his pen. These were collected and issued under such titles as *Sixes and Sevens, The Trimmed Lamp, The Four Million, The Voice of the City, Options, The Gentle Grafter* and *Cabbages and Kings*.

Ohio. "The Buckeye State," is one of the north central states of the American Union. It is bounded on the north by Michigan and Lake Erie; on the east by Pennsylvania and the Ohio River; on the south by the Ohio River; and on the west by Indiana. The state has a total area of 41,040 square miles, of which 300 square miles are water. From east to west the longest line is 225 miles, and 210 miles is the longest from north to south. The northern or Lake Erie shore line is 230 miles long, while the southern or Ohio River line is 436 miles long. The Ohio River separates the state from West Virginia and Kentucky.

The People. In 1920 Ohio had 5,759,394 inhabitants, less than three-quarters of a million of whom were foreign born. The state stood in fourth place in the matter of population. Ohio is one of the eleven states having a density of more than a hundred people to a square mile; in 1920 the density was 141.4 to a square mile. By far the greater number of foreigners or persons of foreign parentage are Germans.

Five Ohio cities have more than 200,000 inhabitants, and the population is 63.8 per cent urban. The largest city in the state and the fifth in the Union is Cleveland; and the county of which this city is the seat —Cuyahoga County—has the largest population among Ohio counties.

Physical Features. There are three distinct surface areas in the state. Along Lake Erie is a strip of old lake bottom, 5 miles wide on the east and broadening to approximately 70 miles on the west, which is almost level. A line drawn from north to south-southwest, beginning below this level strip, separates Ohio into a low plateau on the east—an extension of the Alleghany Plateau—and gently undulating prairie on the west. Near Bellefontaine, in the central part of the state and west of the median line, is the greatest elevation, 1,540 feet. The mean elevation is 850 feet. At the mouth of the Great Miami River, in the southwestern corner of the state, is the lowest point above sea level, 425 feet. The plateau region, especially in the south, is hilly, and the Ohio River runs a part of its course along the boundary between bluffs 300 to 600 feet high.

The drainage is into the Ohio and into Lake Erie. Across the state from the northeastern corner to a point about the middle of the western boundary runs a slight elevation separating the two drainage areas. Thus the greater part of the drainage is into the Ohio. The principal rivers flowing southward are the Great Miami, the Little Miami, Hocking, Scioto and Muskingum. The latter is the longest river that lies entirely within Ohio's boundaries, and it is navigable for about 100 miles from its mouth. Northward into Lake Erie flow the Maumee, Sandusky, Huron, Vermillion, Black, Cuyahoga and Grand rivers.

Some of Ohio's rivers have cut into the rock and now flow in deep channels between

high and picturesque bluffs that add greatly to the scenic beauty.

CLIMATE. The average temperature is about 52°, but extremes of heat and cold are usual. The summers are very hot and often dry, while in winter the temperature often drops to zero or below. The climate of the northern part of the state is tempered by proximity to Lake Erie. The average rainfall is 39 inches. The heaviest fall is in the south. The north, on the other hand, has the heaviest snowfall.

MINERALS. Ohio is fourth among the mineral producing states. Of the first importance is coal, of which 45,000,000 tons were raised in 1920. Iron, petroleum, natural gas, glass sand, pottery clay, limestone, sandstone, salt, gypsum, potash and pyrites are found. Ohio was among the first petroleum and gas producing states; there are two large fields, one in the northwestern part of the state, and the other in the southeast. The output of the northwestern field always appears in lists of petroleum statistics under the heading of Lima, from the city of that name, which is the oil capital of the state. Many of the finest buildings in Ohio are made of native sandstone. The limestone that is found is used in the production of lime and Portland cement. The coal producing regions are in the eastern and southeastern parts of the state; some of the bituminous coal mined in Ohio is of a very high quality.

AGRICULTURE. Though the mining and manufacturing interests of Ohio are of prime importance, it is, and for many decades has been, one of the principal agricultural states of the Union. In 1919, the year of the last agricultural census, the value of Ohio's crops was $607,037,562. This figure was exceeded by the figures of only three other states—Texas, Iowa and Illinois. Corn is the most important crop and is followed by clover, timothy, oats, wheat and potatoes. At the last census Ohio had 3,563,352 acres under corn. The fertile river valleys are eminently productive of this valuable cereal. Wheat was grown on 2,922,592 acres; oats on 1,452,052 acres; and hay crops on 3,026,527 acres when the last census was taken. Rye, barley, sweet potatoes, sugar beets and sorghum are grown, and Ohio is sixth among the states as a tobacco grower. The making of maple sugar and syrup is important, and immense quantities of vegetables and fruits are grown.

Ohio ranks high in the value of its live stock. In the order of their numbers, swine predominate, and are followed by sheep, cattle, horses and mules. There are numerous large farms in the state engaged exclusively in the raising of pure bred horses and cattle; and Ohio is important for the quantity and quality of its dairy products.

MANUFACTURE. Ohio is fourth among the states in the value of its manufactured products, being exceeded only by New York, Pensylvania and Illinois. An abundance of coal and iron, petroleum and natural gas, and excellent transportation facilities have aided Ohio's advancement.

Although the native iron ore is no longer used, the principal industry is the manufacture of iron and steel; in the production of these Ohio is surpassed only by Pennsylvania. Next in importance among its varied outputs are foundry and machine shop products. The chief centers for the manufacture of these commodities are Cleveland, Youngstown, Dayton, Mingo Junction and Ironton.

East Liverpool is the center of the pottery industry; Ohio leads the Union in the quantity and value of its clay products. Cincinnati also has extensive pottery works, producing some of the finest art ware in the United States. Akron leads the world in the production of rubber tires and other rubber goods, and also has extensive printing and publishing plants. Dayton is the world center of the cash register industry, and also produces computing scales, motorcycles, sewing machines and many other articles. Cincinnati is the principal meat packing center, and is one of the first cities in the world in the manufacture of safes and vaults. Toledo produces wagons, automobiles and cut glass, and Cleveland and Ashtabula build ships. Other important industries of wide distribution produce men's clothing, agricultural implements and machinery, tobacco products, boots and shoes, plate glass and blown glass, grindstones and flour and grist.

OHIO

The Buckeye State

1. Buckeye
2. Fruit
3. Lake Commerce
4. Ore & Coal Docks
5. State Flower
6. Blast Furnace
7. Farming
8. Coal Mining
9. Sheep and Hogs
10. Stockyards
11. Implement Mfg.
12. Potteries
13. Tobacco Warehouse
14. Oil Wells

Transportation. In 1923 Ohio was spanned by 9,195 miles of steam railroads and 4,223 miles of electric railways. The steam roads include all the important roads that run from the east to St. Louis and Chicago; and several lesser roads run from north to south. All of the Ohio River that touches the state is navigable, and Lake Erie, of course, affords easy transport. The principal lake ports are Conneaut, Ashtabula, Cleveland, Sandusky and Toledo, while those on the river are Cincinnati, Portsmouth and Marietta.

Charities and Corrections. Chief among the charitable institutions are state hospitals at Cleveland, Columbus, Athens, Dayton, Toledo, Long View and Massillon; the Ohio Soldiers' and Sailors' Home; Ohio Soldiers' and Sailors' Orphans' Home; State School for the Deaf; State School for the Blind; State Institution for the Feeble-Minded; Ohio Hospital for Epileptics; and the State Sanitarium. There is a beautiful National Military Home at Dayton. The correctional system comprises the state prison, a state reformatory, an industrial school for boys, an industrial school for girls and a reformatory for women.

Government. The constitution under which Ohio is governed was adopted in 1852, but was extensively amended in 1912, in order that the administrative system should be in keeping with the new needs of the state. The state executive officers—governor, lieutenant-governor, secretary of state, attorney-general and treasurer—are elected for terms of two years. Legislative power is vested in a senate of 37 members and a house of representatives of 125 members. Any Ohio city may adopt the commission form of government, and in the government of cities the initiative, referendum and recall are in effect. The initiative and referendum are also in effect in state legislation, and all elective officers, even members of the legislature, may be recalled. The constitution, as amended, makes provision for the just treatment of female and child workers with reference to hours, night work, etc.: provides for widowed mothers' pensions; and for workmen's compensation. Also since 1912 rapid advances have been made in public health and in educational matters.

Education. That Ohio has an adequate educational system is attested by the fact that only 2.8 per cent of the population is illiterate. Attendance for the full yearly school term is compulsory for all children between the ages of six and eighteen, except that those beyond 16 and through the 7th grade may secure certificates to be employed. There were 12,585 public elementary schools and 872 public high schools in 1920, and in that year $69,599,629 were expended on education.

At Oxford, Cleveland, Athens and Columbus there are state normal schools.

For higher education there are numerous fine institutions; one of the notable features of Ohio's system is that there are three state universities, two small and one large. The chief seats of higher learning are Kenyon College, Mount Union College, Case School of Applied Science, Otterbein College, College of Wooster, Muskingum College, Western Reserve University, Miami University, Denison University, Oberlin College, Saint Xavier College, University of Dayton, Oxford College for Women, Western College for Women, Antioch College, Ohio Wesleyan University, Baldwin-Wallace College, Marietta College, and, at the head, the Ohio State University.

The latter, established by the legislature in 1870, is situated in Columbus, the capital. It was first named the Ohio Agricultural and Mechanical College, but it was reorganized in 1878 as Ohio State University. Courses are offered in the arts, sciences and philosophy, medicine, engineering, education, veterinary medicine, law and agriculture, and there is a graduate school. A great part of the university's land holding is devoted to agricultural and horticultural experiment, and at Sandusky there is a laboratory for summer biological work. In 1922 the university had 7,817 students and a faculty numbering 676.

History. Ohio was the home of an ancient mound building people who have left many thousands of indications of their activity. La Salle visited the country comprised in the present state in 1670, and

this area was taken into French possession as a part of the Northwest Territory in 1671. The British and French quarreled over the territory for a number of years, but by the Treaty of Paris of 1763 the British gained possession as far west as the Mississippi River. The first land sold at public sale by the United States was sold to the Ohio Company; it was a large tract of land northwest of the Ohio River and included the southeastern part of the "Buckeye State." Thus in 1787 Ohio became officially a part of the Northwest Territory. The first settlement, the present Marietta, was established a year later, and Cincinnati was founded in 1789. After a troublous period spent in suppressing the Indians, the Territory of Ohio—which included Indiana—was organized, with Chillicothe as the seat of government. In the next year, 1800, Indiana began its separate existence. Ohio was admitted to the Union in 1803, the fourth after the original thirteen. Columbus was chosen as the capital in 1816.

Ohio was on the main route of the movement westward towards the plains, and as a consequence it developed rapidly. The state entered the Civil War on the Union side, contributing men, money and arms to the limit of its ability. The state has always had an intense political life; it has given the United States five Presidents, all native born, and was the birthplace of two who were resident in other states when elected. The state, except in 1912 and 1916, has always voted Republican in Presidential elections.

STATISTICS. The following statistics are the latest to be had from reliable sources:

Land area, square miles	40,740
Water area, square miles	300
Forest area, acres	4,250,000
Population (1920)	5,759,394
White	5,571,893
Negro	186,187
Foreign born	678,697
Chief cities:	
Cleveland	796,841
Cincinnati	401,247
Toledo	243,167
Columbus	237,031
Akron	208,435
Dayton	152,559
Youngstown	132,258
Canton	87,091
Springfield	60,840
Lakewood	41,732
Lima	41,326
Hamilton	39,635
Number of counties	88
Members of state senate	35
Members of house of representatives	130
Salary of governor	$10,000
Representatives in Congress	24
Assessed valuation of property	$10,633,102,422
Bonded indebtedness	$679,087,137
Farm area, acres	23,515,888
Improved land, acres	18,542,353
Corn, bushels	159,326,000
Oats, bushels	37,122,000
Wheat, bushels	28,697,000
Potatoes, bushels	6,728,000
Barley, bushels	2,037,000
Rye, bushels	1,079,000
Clover seed, bushels	224,000
Hay, tons	4,084,000
Tobacco, pounds	38,640,000
Sorghum syrup, gallons	320,000
Beet sugar, short tons	51,000
Wool, pounds	13,200,000
Domestic Animals:	
Horses	795,000
Mules	28,000
Milk cows	1,009,000
Other cattle	996,000
Sheep	2,773,000
Swine	3,921,000
Manufacturing establishments	16,125
Capital invested	$3,748,743,996
Operatives	730,733
Raw material used	$2,911,947,871
Output of manufactures	$5,100,308,728
Flour and grist	$89,396,619
Rubber goods	$551.118,488
Iron and steel	$805,603,460
Foundry and machine shop products	$664,161.568
Boots and shoes	$71,354,850
Clothing	$106,873,024
Tobacco products	$28,854,444
Electrical goods	$156,924,143
Paper	$55,098,196
Automobiles and parts	$287,045 832
Furniture	$35,224,313
Glass	$35,240,877
Packing house products	$170,337,892
Brick and tile	$32,172,576
Lumber products	$32,428,847
Pottery	$28,675,361
Mineral products:	
Petroleum, barrels, (42 gals.)	7,364,934
Coal, tons	45,000,000
Natural gas (thousands of cubic ft.)	91,128,131
Clay tons	1.811.000
Cement, value	$3,339,000
Limestone, value	$6,742.496
Miles of railway	9.195
Teachers in public schools	35.000
Pupils enrolled	989,987

Ohio Company, in the history of America, a name given to two companies organized in the eighteenth century for the purpose of making settlements in the Ohio Valley. The first company was composed of an organization of Virginia planters and some London merchants. This was organized in 1749. George II made to it a grant of 500,000 acres of land, principally south of the Ohio River, in that portion of the South which is now West Virginia. It was explored in 1750-51 by Christopher Gist, a surveyor. Thomas Lee, President of the Virginia council, was the originator of the undertaking, and Lawrence Washington, a brother of George Washington, was a leading member, but colonization was interrupted owing to the War of Independence.

The second company, known as the Ohio Company of Associates, was organized at Boston, March 3, 1786, by officers and soldiers of Massachusetts, Connecticut and Rhode Island, for the purchase and settlement of western lands. General Rufus Putnam, Benjamin Tupper, Samuel H. Parsons and Manasseh Cutler were chosen as directors. The lands selected for purchase were situated along the course of the Ohio River, on both sides of the Muskingum. The company secured a grant from Congress. Two contracts were signed, one by which the Ohio Company purchased for 66⅔ cents an acre, 1,500,000 acres of land along the north bank of the Ohio River. This tract extended from what is now Marietta, to a point opposite the present Huntington. The second contract was an option to purchase land bounded by the Ohio and Scioto Rivers. Contracts were drawn up by the interested parties, and under the leadership of General Putnam, surveyors and other workers emigrated to the new settlement, arriving in April, 1788. Opposite Fort Harmer they platted a town, which they named Marietta, in honor of Marie Antoinette, the French queen. See NORTHWEST TERRITORY.

Ohio River, one of the largest rivers of the United States and the most important tributary of the Mississippi, is formed by the confluence at Pittsburgh, Pa., of the Alleghany and Monongahela rivers. From its headwaters to its mouth, at Cairo, Ill., the Ohio traverses 975 miles of the richest farming and industrial section of the United States. The drainage basin of this great stream exceeds 200,000 square miles. At Pittsburgh the river has an elevation of 1,021 feet above sea level, while at Cairo the elevation is 322 feet. On its course to the Mississippi the river touches the southern borders of Ohio, Indiana and Illinois and the northern borders of West Virginia and Kentucky. From the north it receives the waters of the Wabash, Muskingum, Scioto and Great Miami rivers, and from the south the waters of the Kanawha, Licking, Green, Kentucky and Tennessee rivers. Hundreds of smaller rivers also flow into the Ohio between its source and the Mississippi River.

When the Ohio River was discovered its bed was choked with bars of sand and it was almost unnavigable in some parts because of long, shallow rapids. The bars have been dredged out by the Federal government, and by the aid of canals, dikes and dams the stream has been converted into a very important artery of commerce. But, because of the great variation in the water level between the flood and the dry seasons, navigation on some parts of the river is still precarious. The Ohio basin is subject to disastrous floods such as that of 1913, when more than 400 lives and property to the value of $180,000,000 were lost. Often at the time of the heavy spring rains the water of the Ohio rises suddenly and overflows the banks, inundating the low farmlands and towns along its course.

Many fine towns and cities are situated on the Ohio, and the river has been the prime factor in the industrial and commercial development of the greater number of them. The more important cities along its course are Pittsburgh, Pa., Parkersburg, W. Va., Marietta, Ohio, Cincinnati, Ohio, Louisville Ky., Paducah, Ky., Evansville, Ind., Mount Vernon, Ind., and Cairo, Ill.

Oil, a well known substance with a greasy, sticky feel. Oils are composed of the same chemical elements as sugar and alcohol—namely, charcoal and water. All

oils are lighter than water, and are insoluble in it. There are several hundred oils, divisible into three general classes: mineral oils, fatty or fixed oils, and essential or volatile oils. The mineral or rock oils are petroleum and its various products, as kerosene, gasoline, naphtha, and the like. When reduced, they produce paraffin, vaseline, and various lubricating oils used for machinery. The fatty or fixed oils leave a permanent greasy stain on paper. They are derived from animal and vegetable sources. They differ from fats chiefly in being liquid at ordinary temperature.

Some fixed oils dry out on exposure to the air, leaving a film or varnish. These are called drying oils, and are much used in varnishes and paints. Linseed oil, derived from the seed of the flax plant, may be described as a vegetable oil.

A number of non-drying fixed oils are obtained from various vegetable and animal sources. All may be used for soapmaking. Peanut oil is pressed from peanuts. Olive oil, obtained from the fruit of the olive tree, is an important article of food in semi-tropical countries. Its chief use is in salads. Users also dip bread in it, using it as we do syrup and molasses. Fish oils are obtained by boiling the entire body of the fish. Cod liver oil, of particular value as a cure for consumption, is obtained from the liver of the codfish by a process of rendering by steam. Whale oil or train oil is rendered from the blubber of the Greenland or right whale. It is obtained by boiling in water. It is a valuable oil in dressing leather and in tempering steel. It was much used formerly for illuminating purposes. Sperm oil is obtained from the blubber and head cavity of the sperm whale. It is one of the most valuable lubricating oils and is used also for tempering steel. Neat's foot oil, a valuable lubricator and dressing for leather, is obtained by boiling the feet and shin bones of cattle in water. Lard oil is a liquid pressed out of cold lard. Of the fats, lard is, of course, prepared from the fat of the hog, and tallow from the solid fat of the sheep or ox. Palm oil is prepared from the fruit of several varieties of palms found chiefly on the west coast of Africa.

Volatile oils are so called because they evaporate readily at ordinary heat. They leave no stain. They are called essential oils also. When absorbed by alcohol they make the essences or perfumes; as essence of peppermint, essence of wintergreen, etc. A brief description of the essential oils would occupy 300 pages of this volume.

Some of the prominent volatile oils are fern oil, obtained from the stems of various ferns; oil of turpentine, from the pines and firs; oil of cypress, from the wood of the cypress; sequoia oil, from the needles of the California giant; and hemlock oil, from the needles and twigs of the hemlock. Juniper berries, juniper wood, red cedar wood, cedar leaves, and the wood of the Lebanon cedar yield oils of the name. A number of grasses belonging to the genus *Andropogon* yield the ginger-grass, lemon-grass, cardamon-grass, and citronella oils of the druggist. Palmetto oil is obtained from the berries of the saw-palmetto. The aloe plant, garlic, leek, onion, saffron, and orris or iris yield characteristic oils. Ginger oil, cardamon oil, black pepper oil, oil of cubebs, oil of betel leaves, bayberry oil, and sweet-birch oil are obtained from the plants of that name. Oil of hops, of hemp, of ginger, of anise leaves, of mace, of nutmeg, of camphor, of cinnamon, of cassia, of cloves, of sassafras, of laurel, of mustard, of watercress, of mignonette, of bitter almond, of wild cherry, of tolu, of rose-geranium, of rue, of lemon, of sweet orange, of bitter orange, of bergamot, of myrrh, of sandalwood, of senega root, of tea, of pimento, of bay, of cloves, of eucalyptus, of celery, of parsley, of caraway, of fennel, of asafoetida, of dill, of Labrador tea, of wintergreen, of jasmine, of verbena, of rosemary, of lavender, of spike, of catnip, of sage, of pennyroyal, of hyssop, of sweet marjoram, of thyme, of peppermint, of spearmint, of elder, of valerian, of camomile, of tansy, of feverfew, of wormseed, of wormwood, and of arnica, are only a few of the many essential oils derived from vegetable sources. As stated before, they are composed of carbon, hydrogen, and oxygen, each with some peculiar property of its own. The mint family is remarkable for its oils. The frankincense of the Orientals and attar-of-roses are well known volatile oils. The delightful fragrance of peach and apple blos-

soms, of new mown hay, of corn-fodder, of sweet clover, and of the plant world in general is due to the escape of essential oils. Many of the essential oils may now be produced in the laboratory of the chemist. The flavor of pineapple may be obtained from rancid butter and alcohol.

See PETROLEUM; PERFUMERY; PAINT; DISTILLATION; FLAX.

Oilcake. See COTTON.

Oil City, Pa., is 132 miles north by east of Pittsburgh, on the Alleghany River at the mouth of Oil Creek. It is served by three railroads, the Pennsylvania, the Erie and the New York Central. It was settled in 1825 but was only a village until the discovery of oil nearby in 1859. It is now an important refining and shipping point for Pennsylvania oil and its by-products. Its manufactures include refined oil and gasoline, oil well supplies, gas and oil engines, water tube boilers, pumps and explosives. Among the prominent buildings are the Standard Oil Company's building, several fine business blocks, the government post office, a Young Men's Christian Association, the Odd Fellows Temple, the Masonic Hall, the city hospital and numerous churches. The city has a Carnegie library, a senior and two junior high schools. In 1892, a flood in Oil Creek undermined some storage tanks filled with naphtha and carried the volatile fluid down the stream and into the city. It was accidentally ignited so that the swollen stream became a river of fire setting fire to buildings along its banks, causing a property damage of a million dollars and killing more than fifty people. Population, in 1920, 21,274.

Oilcloth, a variety of floor covering. The foundation of oilcloth is jute burlap. The burlap is first sized with varnish, glue, or starch. It is then painted with a mixture of ocher, linseed oil, and benzine; after which it is dried, rubbed smooth, and again painted. This process is repeated from four to nine times, according to the quality of cloth to be produced. The oilcloth is then printed in any desired patterns and colors, the printing being done by the block method. The foundation is of coarse muslin, and it is coated with oil, turpentine, and umber. See LINOLEUM; PRINTING.

Ojibways. See CHIPPEWAS.

Okapi. See GIRAFFE.

Oklahoma, (Land of the Red Men), one of the west south central states, commonly known as "The Boomer State." This state, formed by uniting the Oklahoma and Indian territories, was the forty-sixth to enter the Union. Its boundaries are formed by Kansas, on the north; Missouri and Arkansas, on the east; Texas, on the south; and Texas and New Mexico, on the west. Oklahoma has a total area of 70,057 square miles, 643 of which are water. On the northern border of the state is a strip called the "Panhandle;" it is 35 miles wide from north to south, and extends westward for 120 miles beyond the main body of the state and touches New Mexico.

THE PEOPLE. In respect to population Oklahoma ranks twenty-first among the states. In 1920 the inhabitants numbered 2,028,283, an increase of 22.4 per cent over 1910. There are large Negro and Indian elements in the population, but the Indians have almost lost their separate identity. No tribal organization exists for governmental purposes, though there are still business organizations for the control of tribal lands. Some of the Indians have become enormously wealthy through royalties from oil lands. Twelve Oklahoma cities have populations in excess of 10,000, but only 26.6 per cent of the population is urban. The density is 29.2 to a square mile.

LAND AND WATER. The state is a broad, elevated plain whose drainage is generally south and southeast. The surface is not monotonously level, however, but is broken in a number of places by low and often very picturesque mountains. The Ozark range extends into the state from Missouri, giving the northeastern portion of the state an elevation of about 500 feet above the general surface. The streams of this section have cut into the limestone that forms these mountains and now flow in narrow channels. Low, wooded mountains extend down the eastern border. In the south, and extending into Oklahoma for 100 miles from the Arkansas boundary, are

the Washita Mountains. These are narrow, rugged sandstone ridges that do not attain a height exceeding 3,000 feet above sea level. In the south central part are the Arbuckle Mountains, a low range about 60 miles long and not exceeding 30 miles wide that in no place rises more than 700 feet above the surrounding country. This range is noted for its delightful scenery. In the southwest are the Wichita Mountains, a chain of gaunt granite peaks that rise sharply from the level plain. The granite in this range has a high commercial value.

Though the rivers and streams of Oklahoma are numerous, none of them is navigable. The largest river of the north is the Arkansas, and before this stream reaches the Arkansas border the Salt Fork, Verdigris, Grand and Illinois enter it from the north and the Cimarron, North Canadian and Canadian from the south and west. This system is the largest in the state. The Red River separates Oklahoma from Texas. Its chief tributaries are the Red River, North Fork and the Washita. There are no lakes in the state, and in the hottest weather some of the streams go almost dry.

Climate. The climate is dry, warm and healthful. The mean annual temperature is 60° F. The rainfall, averaging 37.5 inches, is heaviest in the east, lightest in the west, varying from 15 to 20 inches. This gives all of the state, save the western end of the "Panhandle," enough rain for agricultural production. In the southern part of the state snow is rarely seen.

Mining. Oklahoma takes seventh place among the mineral producing states, and the most important mineral is petroleum. Coal, zinc, limestone, lead, salt, glass sand, gypsum, granite, copper, asphalt, lead, pottery clay, and small quantities of gold and silver are found. The coal fields are in the northeastern corner of the state, extending southward as far as Arkansas. Ottawa County, also in the northeast, yields lead and zinc. The oil and gas fields are almost all east of the center of the state, and extend from Kansas to Texas. Petroleum was found in 1905. Production developed so rapidly that in 1920 the total flow was 105,725,000 barrels, the greatest in the Union. Oklahoma petroleum has aided greatly in putting the United States ahead of the world in the production of this precious liquid.

Agriculture. Oklahoma is not now one of the important agricultural states, but only the industry of man is needed to put her close to the top. Until 1889 the land comprised in the state was held by the Indians — Creeks, Choctaws, Chickasaws, Cherokees and Seminoles — and its great plains were given over to the pasturing of cattle from Texas. White settlement began with the "rush" of 1889, and the agricultural history of the state must be said to date from that time. Wheat, corn and cotton are the principal crops, and these are followed by oats, barley, sweet potatoes, broom corn, potatoes, tobacco, peanuts, sugar cane, hay and forage crops. Soil and climate permit the raising of two crops of potatoes a year, and fruits and berries will grow abundantly in almost any part of the state. Oklahoma leads the Union in the production of one valuable crop—broom corn. The "Panhandle" has been brought under partial cultivation by irrigation.

Forests. The latest agricultural census gives Oklahoma a forest area of 5,500,000 acres. Yellow pine is the most abundant and valuable timber the state has. and is followed by oak. Walnut, scrub oak, red cedar and pecan grow in various parts of the state, but none is very abundant.

Manufacture. Petroleum refining is the principal manufacturing industry of Oklahoma, but it is closely rivaled by flour and grist milling. The manufacture of cotton-seed oil and cake, fertilizer and lumber are important; also meat packing and smelting. There are numerous printing and publishing establishments in the state, and the products of foundries, machine shops and car building plants are increasing in importance. When the comparatively brief history of the state is considered, the significance of its 2,445 manufacturing establishments increases.

Transportation. Although it is entirely lacking in water transportation, the state is well provided with railroads. There

Oil Fields.

Cotton Compress.

OKLAHOMA.

are 6,572 miles of steam roads. The most important are the Atchison, Topeka & Santa Fe, Chicago, Rock Island & Pacific, Missouri, Kansas & Texas, St. Louis & San Francisco, Missouri, Oklahoma & Gulf, Midland Valley, Kansas City Southern, Oklahoma Central, Missouri Pacific, Fort Smith & Western and Kansas City, Mexico & Orient. There are upwards of 75,000 miles of good wagon roads in the state.

INSTITUTIONS. Oklahoma charitable and correctional institutions, under the supervision of a commissioner of charities and corrections, include the Oklahoma School for the Blind, Oklahoma State Home, Confederate Soldiers' Home, State School for the Deaf, Industrial School for the Deaf, Blind and Orphaned (colored), School for the Blind, State Sanitarium, Oklahoma Training School for boys and State Reformatory. At McAlester is the Oklahoma prison.

EDUCATION. At the head of Oklahoma's educational system are a superintendent of public instruction and a state board of education. That ample provision has been made for education is indicated by the fact that at the time of the taking of the fourteenth census only 3.8 per cent of the population was illiterate. Primary education is free and compulsory. Separate schools are maintained for colored students. Between 1910 and 1920 the state made rapid advances in all branches of education; as an instance, there were 29 accredited four year high schools in 1912 and 269 in 1920. There are six state normal schools, and the institutions for special, technical and higher education are the Oklahoma College for Women, Agricultural and Mechanical College, School of Mines and Metallurgy, Kingfisher College, Oklahoma Catholic College for Women, Oklahoma City College, University of Tulsa, Epworth University, Phillips University, Oklahoma Baptist University, Oklahoma Nazarene College, Oklahoma Presbyterian College for Girls and the University of Oklahoma, the highest institution in the state.

The state university, at Norman, was established in 1892 by enactment of the legislature of Oklahoma Territory. The university comprises colleges of arts and science, engineering, medicine, law, pharmacy, education, nursing, journalism, industry and commerce, geology and natural history, and there is a graduate department and an extension division. Students who are residents of the state may enter the university without the payment of tuition. In 1922 the student body numbered 4,700 and the faculty 163. The library contains not less than 30,000 volumes.

GOVERNMENT. Oklahoma is governed under its original constitution, adopted upon its admission to the Union in 1907. The legislature consists of two houses; the upper house consists of not more than 44 members, the lower of not more than 109. The franchise is extended to all men and women who have reached their majorities, including those of Indian descent who can read and write English and who have resided in the state for one year, in the county for six months and in the precinct for thirty days. A law designed to bar Negroes from voting was adopted in 1910 but was declared unconstitutional in 1915. The initiative and referendum are in effect.

Oklahoma's executive body consists of the governor, lieutenant-governor, attorney-general, secretary of state, treasurer, superintendent of public instruction, state examiner, mine inspector and commissioners of charities and corrections, insurance and labor. A clause of the constitution bars the governor, secretary of state, treasurer and auditor from immediate reelection. The judicial system comprises the state supreme court and district, county and municipal courts. The constitution makes provision for the regulation of child labor, for workmen's compensation and for mothers' pensions.

HISTORY. It is probable that the territory now included in Oklahoma was explored by the Spaniards who held the land that was later included in the Louisiana Purchase. This was set aside in 1834 as "Indian Territory," and was inhabited by the "Five Civilized Tribes" — Cherokees, Creeks, Choctaws, Chickasaws and Seminoles. The Creek Indians, however, sold to the United States at the rate of 30 cents an acre the western part of their holdings,

and a short time later the Seminoles sold all of theirs for 15 cents an acre. The whites were excluded from Indian Territory by law, but some crept in and settled, and it was necessary to use United States troops to dislodge them.

After the purchase of the Indian lands the United States negotiated with the Creeks and Seminoles for the right to open up for settlement these unoccupied areas. The right was granted, and on April 22, 1889, began the historic race for the best farm lands. From the rapid development of industry and commerce, from the mushroom growth of towns and cities, following this event, Oklahoma derives its popular sobriquet—the "Boomer State."

Oklahoma Territory was organized in 1890 and the first territorial legislature met at Guthrie in that year. Agitation for statehood began in the following year. A bill to admit Oklahoma as a state passed the National House, also in 1891, but was defeated in the Senate. After a period of unremitting agitation for statehood, Oklahoma and Indian territories were declared united in 1906 and were admitted in 1907. The constitution of the new state was an extremely radical instrument and was opposed again and again by President Roosevelt, but it was adopted by a large majority. In 1911 the capital was moved from Guthrie to Oklahoma City, and though efforts have been made to return it to Guthrie, they have been futile.

STATISTICS. The following are the latest reliable statistics available:

Land area, square miles	69,414
Water area, square miles	643
Forest area, acres	5,500,000
Population	2,028 283
White	1,821,194
Negro	149,408
Indian	57,337
Chief cities:	
Oklahoma City	91,295
Tulsa	72,075
Muskogee	30 277
Okmulgee	17,430
Enid	16 576
Bartlesville	14 417
Ardmore	14 181
Shawnee	13,348
Number af counties	77
Members of state senate	44
Members of house of representatives	100
Salary of governor	$4,500
Representatives in Congress	10
Assessed valuation of property	$1,664,448,745
Bonded indebtedness	$2,972,000
Farm area, acres	31,989,950
Improved land, acres	18,488,105
Corn, bushels	75,925,000
Wheat, bushels	47,325,000
Oats, bushels	35,300,000
Barley, bushels	2,684,000
Sweet potatoes, bushels	2,646,000
Potatoes, bushels	2,088,000
Hay, tons	1,868,000
Peanuts, pounds	10,800,000
Cotton, bales (500 lbs.)	530,000
Wool, pounds	526,000
Broom corn, tons	19,200
Domestic Animals:	
Horses	667,000
Mules	292,000
Milk cows	549,000
Other cattle	1,118,000
Sheep	110,000
Swine	836,000
Manufacturing establishments	2,445
Capital invested	$277,034,318
Operatives	29,503
Raw material used	$312,605,829
Output of manufactures	$401,362,869
Petroleum, barrels (42 gals.)	105,725,000
Coal, tons	3,750,000
Miles of railway	6,572
Teachers in public schools	16,135
Pupils enrolled	586,347

Oklahoma City, Okla., the capital and metropolis of the state and the county seat of Oklahoma County, is situated on the North Fork of the Canadian River, near the center of the state, 33 miles south of Guthrie and 210 miles north of Fort Worth, Tex. The city is served by interurban electric lines to Norman, Guthrie and El Reno, and by the Chicago, Rock Island & Pacific, Atchison, Topeka & Santa Fe, Missouri, Kansas & Texas and St. Louis & San Francisco railroads.

Oklahoma City dates its existence from the opening of Indian Territory to settlement in 1889 (See OKLAHOMA, subtitle *History*) and has grown into a modern city in every respect. The planners of Oklahoma's capital made provision for expansion, and there are no badly crowded quarters. A total of more than 1,400 acres of land has been set aside as public parks, a wide boulevard encircles the city, and the public buildings are well constructed and handsome. The most prominent structure is the capitol. Other fine

buildings are the Carnegie library, Federal building, Oklahoma City College and Central High School buildings, several churches, Masonic Temple and a number of office buildings.

The commercial interests of Oklahoma City are extensive, as the city is on the main trade routes from north to south and from west to east. Cotton, refined petroleum, grain, live stock and fruit are important items of this commerce.

The manufacturing establishments of the city are engaged in the production of refined petroleum, cotton-seed oil and cake, soap, flour and grist, machine shop and foundry products, crackers and other articles. There are extensive meat, egg and poultry packing establishments, and printing and publishing plants. A branch Federal Reserve bank is housed in a new building.

In 1900 Oklahoma City had a population of only 10,037, but this had increased to 64,205 in 1910. It was made the seat of the state government in 1911, and in 1920 the population was 91,295.

Old Age Pensions, provisions for the aged poor. The notion of state pensions for the aged has not taken root in the United States, but it is a live question elsewhere. A paragraph for each of several countries will show what the world is doing to save the aged from the humiliation of dependence. Unless stated otherwise, the figures hold approximately true for January 1, 1921.

UNITED STATES. No national law affecting old age pensions is in existence in the United States, but a number of the states have passed laws creating pensions for state employes, and in some cases county and city employes who have seen specified amounts of service.

CANADA. A modified plan went into effect July 20, 1908. The government has simply gone into the business of selling annuities. Payment to the government may be made through the post offices. Employers may arrange to pay for their employes by a lump sum, and fraternal organizations are atuhorized to pay for all members in one sum. Except in case of infirmity, annuities are not available until the buyer attains fifty years of age. The annuities range from $50 to $600. They are extempt from seizure for debt.

GREAT BRITAIN. Various old age pension acts were created in Great Britain between 1909 and 1918. The effect of these is that, in general, every person who has reached the age of 70 who has been a British subject for ten years to date of receipt of pension; who, if a native-born British subject, for twelve of twenty years, and if not native-born, for twenty years preceding receipt of pension, has been resident in the United Kingdom and whose yearly income does not exceed 79 English pounds, is entitled to pension. For blind pension the age limit is 50 years. Lunatics and those who receive what is known as indoor poor relief are disqualified. On March 5, 1921, there were 1,002,342 persons (353,794 men and 648,548 women) drawing pensions. The total amount paid in 1920-21 was, roughly, $125,000,000. The amount of the pension (determined by the recipient's income) varies from one to ten shillings weekly.

DENMARK. Old Age pension laws were enacted in Denmark before 1891, and in that year and in 1902 and 1908 they were extended. They now include all those who, having reached the age of 60, can prove residence in Denmark for five years preceding the receipt of pension and who are known to be of good character. During the five years of residence in Denmark the recipient must not have received charitable assistance. The aid extended under the old age pension law may be in the form of money, in kind, or may be residence in a hospital; but in any case it must be sufficient for maintenance and for medical attention in case of illness. To January 1, 1921, 98,525 persons received aid.

FRANCE. An old age pension law was enacted in France in 1905; in this act the minimum age at which the drawing of relief might begin was placed at 70, but by amendment in 1910 the age limit was reduced to 65. The latest figures available for France give 10,475,272 as the number of persons registered for relief under this act.

ITALY. No old age pension law exists in Italy, but there are many permanent public charity foundations, regulated by law, whose function is the relief of the poor in general. At the last census these institutions numbered 31,543.

BELGIUM. This country has not been tardy in enacting laws for the care of the dumb, blind, aged or homeless, but an old age pension law, in the sense in which such laws exist in Denmark and Great Britain, has not yet been enacted.

AUSTRALIA. The invalid and old age pensions act of Australia provides for the payment of invalid and old age relief at the discretion of the Commissioner in charge of this, and in such amounts as he deems sufficient. Pensioners must have attained 65 years and must have resided in Australia or Australian territory not less than twenty years; in the case of invalids the term of residence is five years. A total of 140,396 persons were registered for pensions on January 1, 1921, of whom 102,415 applied for old age pensions.

SWEDEN. This country has no old age pension law, but those who are incapacitated by age are well cared for, since the law of the nation provides that all who, because of age, disease or physical or mental infirmity, have become unable to support themselves, must be fully provided for by the communes in which they reside. The poor-law ordinances were passed in 1918, and at the last census in Sweden 25,618 persons were receiving relief.

SPAIN. In 1908 Spain established a National Institute of Provision for granting old age pensions. The law under which the institute was founded has since been broadened and amended, until at present (1923) all workers between the ages of 16 and 65 whose annual income is less than $772 (par) are granted old age insurance. The annual amount of this grant may not exceed $300.

Old Catholics. See PAPACY; PIUS IX.

Old Curiosity Shop, a novel by Charles Dickens, published in *Master Humphrey's Clock* during 1840-41. Little Nell and her grandfather are the central figures of the story, although Dick Swiveller, Quilp, and the Marchioness come in for attention.

Old Grimes, the title of an old and well known song by the Honorable Albert G. Greene of Rhode Island. The first verse of the song was not written by Mr. Greene. Its authorship is unknown. In 1882 or 1823 Mr. Greene, then a young man, was attending a law school at Litchfield. A small barber shop in the town was kept by a fugitive slave from Virginia, who had taken the name of his former master, William Grimes. Mr. Greene was in the habit of turning off rhymes at short notice on any and every subject, and when the negro asked for verses the young student took the old verse beginning, "Old Grimes is dead," humorously mingling praises of the old man's virtues with descriptions of his clothing.

Old Ironsides, the name applied to the United States frigate Constitution. The frigate was built in Boston in 1797, and did valiant service in the War of 1812 under Captain Isaac Hull. She has the distinction of participating in the first and last battles of the war. In 1812 she defeated the Guerriere and the Java; in 1814 the Cyane and the Levant. In 1828 the Constitution was reported unseaworthy and ordered broken up, but Holmes saved her from destruction by his stirring poem, *Old Ironsides,* and thereafter she was popularly known as Old Ironsides. As a result of this agitation she was rebuilt in 1834 and afterward circumnavigated the globe, averaging 106 miles per day.

Ay, tear her tattered ensign down!
  Long has it waved on high,
And many an eye has danced to see
  That banner in the sky;
Beneath it rung the battle shout,
  And burst the cannon's roar;—
The meteor of the ocean air
  Shall sweep the clouds no more.
Her deck once red with heroes' blood,
  Where knelt the vanquished foe,
When winds were hurrying o'er the flood
  And waves were white below,
No more shall feel the victor's tread,
  Or know the conquered knee;—
The harpies of the shore shall pluck
  The eagle of the sea!
O better that her shattered hulk
  Should sink beneath the wave;
Her thunders shook the mighty deep,
  And there should be her grave;
Nail to the mast her holy flag,
  Set every threadbare sail,
And give her to the god of storms,
  The lightning and the gale!

Old Man of the Sea, The, in the story of Sinbad the Sailor, *Arabian Nights' Entertainments,* an old man whom Sinbad undertook to carry across a brook. When he had been hoisted to Sinbad's shoulders he clung so tightly that he could not be dislodged. At last Sinbad succeeded in getting his disagreeable burden drunk and then shook him off.

Old Mortality, the popular name of a Scottish stone mason. His real name was Robert Paterson (1715-1801). He was a native of Hawick, Scotland. His business was that of a stone-cutter. He worked a quarry, making a specialty of the flat slabs used as gravestones in the district about Galloway. These slabs were of suitable size to cover a grave. They were laid flat on the ground. In 1745 he took part in the insurrection of Prince Charlie, the Pretender. He was taken prisoner and carried to England. On his return he became so much interested in the restoration of the Covenanters' graves that he abandoned his family and traveled about Southern Scotland with a kit of tools. Whenever the inscription on a slab above a Covenanter's grave had been worn down by the hobnails of those frequenting the churchyard so as to become illegible, he set to work cutting the letters anew. An account of the old man reached Walter Scott and was taken as the basis of a novel known as *Old Mortality.* See COVENANTERS.

Olean, N. Y., is on the Allegheny River and the Pennsylvania, Erie, Pittsburgh, Shawmut & Northern, and Olean, Salamanca & Bradford railways, 71 miles south by east of Buffalo and five miles north of the Pennsylvania border.

The city is an industrial center of importance. It is near the Pennsylvania oil fields and is the terminus of numerous pipe lines and has large storage facilities. There are manufactories of refined petroleum, leather, flour, glass, bricks, silk, cutlery and other articles. Repair shops of the Pennsylvania Railroad are located here.

Olean has a high school, a public library, several parks, a state armory and Higgins Memorial Hospital. The first settlement was made in 1804 and a charter was secured 1893. Population in 1920, 20,506.

Oleander, an old-fashioned, milky-juiced, decorative shrub. There are two or three species. The common oleander is a native of the Mediterranean region. In the Bermudas it is a hedgerow bush twenty-five feet high. In the Southern States it is a favorite garden shrub. In the North it is grown in tubs and is a favorite, as it requires little attention and its blossoming season is long. The tub holding the plant is set out of doors during the summer.

Oleomargarine, ō-lē-ō-mär′ga-rĭn, a substitute for butter. It is made chiefly from animal fats. One formula for high grade oleomargarine is as follows:

	Lbs.
Purified beef fat	100
Purified lard	130
Butter	95
Salt	32
Coloring material	⅓
Total	357⅓

A cheaper grade is obtained by substituting cotton-seed oil and milk for butter. The oil made from mutton tallow cannot be used, as it is almost impossible to deprive it of odor. The manufacture and sale of oleomargarine are controlled by United States statute. A manufacturer must pay a special tax of $600. All packages must be marked plainly with the name, *oleomargarine.* Internal revenue stamps must be affixed to packages to the amount of ten cents per pound for oleomargarine colored to represent butter and one-fourth of a cent per pound for the uncolored article.

These regulations are imposed in the interests of butter makers, and also for the protection of consumers who desire to know when they are buying genuine butter. In 1921, 271,314,700 pounds of oleomargarine were produced in the United States, and the tax paid amounted to $1,574,994. Illinois is the leading state in the industry and produces about one-half of the entire output.

Oligarchy. See GOVERNMENT.

Oliphant, Mrs. Margaret Wilson (1828-1897), an English novelist. She was born at Wallford, Scotland, but while still a child removed with her parents to Liverpool. In 1852 she married her cousin, Francis Oliphant, who died in 1859, leaving her penniless and with three children

to provide for. She had been doing a little literary work for several years and from this time supported the family with her writings. In all she published 120 books besides many contributions to magazines. Her work is not original in any striking degree, and her novels are often lacking in plot, but her characters are natural and are drawn with a sympathetic hand, while the humor and pathos of her pages and her easy style make her books pleasant reading. Among her novels may be mentioned *Miss Marjoribanks, Harry Joscelyn, The Sorceress,* and *The Cuckoo in the Nest. A Little Pilgrim, A Beleaguered City,* and *Old Lady Mary* are stories which deal with the supernatural. Mrs. Oliphant has written biographies also, and many works on literary subjects. *The Makers of Florence, The Victorian Age of English Literature,* and *The Literary History of England* are among them.

Olive, the name of numerous small trees and shrubs of the tropical Old World. Olives of commerce are the fruit of the European olive raised chiefly in Mediterranean countries. Olives and olive oil have played an important part in the Levant from Biblical times to the present day. The olive oil industry is an old one in Syria. Some of the producing trees are 300 to 500 years old, while others were planted by the Crusaders. There is an orchard in Syria whose history is definitely established by a deed covering 490 trees, which was issued 525 years ago. The trees look old, but they bear fruit abundantly. The Shwayfat grove, south of Beirut, is claimed to be the third largest in the world.

Olives require a warm, dry climate. Although our main supply yet comes from Italy and Spain, southern California has engaged in the raising of olives; but while olive culture is one of the oldest branches of the California agricultural industry, olives are not among the most important of California's products, and accurate crop statistics are never available. Italy perhaps plants a twelfth of her cultivated area in olive orchards and exports millions of dollars worth of fruit and oil annually. Spain, Portugal and Greece are heavy producers of olives; Turkey exports olive oil. The olive is a plum-shaped fruit, green in color. The pulp is hard and grainy, and to a beginner exceedingly disagreeable in taste. Green olives are pickled, and are stuffed sometimes with red pimento for table use.

Olive oil is an important article of food in the countries of the Mediterranean. It is obtained by crushing the fruit. The oil of ripe olives is an excellent article of diet. It is rich in fat and albumen. Added to fruit, bread, and vegetables, it forms a complete diet without meat. In the east it takes the place of cream, meat, butter, sirup, sauce, and gravy. Two tablespoonfuls contain as much nourishment as a pound of beefsteak. The finest oil is put up at Leghorn. The olive harvest lasts from November to May.

Olive wood is of a greenish yellow and takes a fine polish for expensive cabinet work. Crinkly olive root is used for snuff boxes and other ornamental articles. Among the Greeks the olive was sacred to Athene Minerva, as the laurel was sacred to Apollo. Twigs of olive likewise were used to crown victors in the games. The dove, it will be remembered, brought Noah an olive leaf. Gen. viii:11. The Mount of Olives was in the vicinity of Jerusalem on the road to Bethany. An olive branch is considered the symbol of peace. "To extend the olive branch," is an offer of agreement.

Oliver, Frank (1853-), a Canadian journalist and statesman, was born in Peel County, Ontario. As a young man he went west to Winnipeg and later to Edmonton. Here in 1880 he founded the Edmonton *Bulletin.* Mr. Oliver entered the political field as a Liberal, and from 1883 to 1888 served as a member of the Northwest Council. When the Northwest Assembly took the place of the Council, Mr. Oliver also served with this body, 1888-96. He was elected to the Dominion House of Commons in 1896, and from 1905 to 1911 was Minister of the Interior and Superintendent General of Indian Affairs in the Laurier cabinet. He was appointed to the Royal Conservation Commission in 1909. Mr. Oliver's name will always be connected with the progressive measures enacted for the Canadian Northwest from 1880 onward, and especially with the

securing of desirable agricultural settlers for this region.

Oliver Twist, a novel by Charles Dickens, published in 1838. Oliver Twist, the hero, is a workhouse orphan. His life is hard and his prospects far from promising at the opening of the story; but in spite of his wretched environment he preserves his fine nature and at last finds friends who aid him to a successful career. The evils of the workhouse system as it existed at that time in England and the criminal side of London life are realistically portrayed. See DICKENS.

Olives, Mount of. See JERUSALEM.

Olla-Podrida, ŏl-la-pō-drē′da, a favorite Spanish dish. It is composed of meat and vegetables cut up fine and stewed together. It is highly seasoned with pepper and other condiments. It is equivalent to the French *pot pourri.* The term is applied to a musical medley also, and to writings that "contain a little of everything."

Olmsted, um′sted, **Frederick Law** (1822-1903), an American landscape architect. He was born at Hartford, Connecticut. He was educated as a civil engineer at Yale. His early manhood was passed as a farmer and horticulturist. In 1850 he traveled in Great Britain, France, and Italy, studying the condition of agriculture and public parks of those countries. He believed that each park should take advantage of the natural lay of the land, and that it should be a combination of cultivation and wildwood. In his judgment, a rocky ledge covered by a thicket should not be disturbed. In other words, nature should be aided, not destroyed, by art. His work in New York City made him the leading landscape architect of America. He laid out parks for Brooklyn, Chicago, Boston, Detroit, Louisville, Buffalo, Milwaukee, Baltimore, and many other less prominent cities. He gave valuable advice relative to the beautifying of the capitol grounds at Washington. He was also one of the first commissioners of the Yosemite National Park and the Mariposa Grove. He was connected with many charitable organizations, being one of the founders of the Metropolitan Museum of Art and the American Museum of Natural History at New York. See CENTRAL PARK.

Olney, Richard (1835-1917), an American lawyer and statesman noted for the wisdom he displayed in conducting affairs as Secretary of State under President Cleveland. He was born at Oxford, Mass., and educated at Brown University and Harvard Law School. Admitted to the Massachusetts bar in 1859, Mr. Olney took no active part in politics except to serve a term in the Massachusetts legislature until he was appointed first United States Attorney-General, and later, Secretary of State. As Attorney-General, Mr. Olney became prominent for his part in the settlement of the great Chicago railroad strike of 1894. In securing an injunction against the strikers he set a precedent for Federal interference in labor disputes. As Secretary of State, Mr. Olney conducted with England the negotiations that grew out of the Venezuela boundary dispute. His letter to the American Ambassador to England relative to this dispute marked a new and broader interpretation of the Monroe Doctrine. He was honored with degrees from Brown, Harvard and Yale universities.

Olympia, the capital of the state of Washington. It is situated on the southern extremity of Puget Sound, and on the Des Chutes River. Inland from Olympia are great forests, and lumbering is a leading industry. Its location on the Sound gives it steamship connection with other important places on the Pacific Coast, and it does a large amount of shipping. Oysters are exported in great quantities.

Olympia, ō-lĭm′pĭ-a, a city of ancient Greece. It was situated on the sacred plain of the Alpheus in Elis, a small country of the Peloponnesus. According to all accounts it was formerly a city of great magnificence. Dust storms, land washed from the neighboring hills, land slips, and silt from the overflowing of the Alpheus have, however, covered the site of the city with earth to the depth of ten or twelve feet. Many thousands of fragments of sculpture are preserved in a museum in Greece.

Olympic Games, the most celebrated of the four great national festivals of Greece. The others are the Isthmian, the Nemean, and the Pythian Games. The term, Olym-

pic games, is used sometimes as a general name for all four festivals; but, strictly applied, it designates only that festival which was held on the plain of Olympia once in four years.

Only Greeks of pure descent could take part in the games. Barbarians might watch the contests. Women and slaves were excluded from among the spectators. For the first thirteen Olympics, the only contest was a foot race. The number of contests gradually increased to twenty-four, including wrestling, boxing, chariot-racing, horse-racing, foot-racing in armor, and in later times, the poets, artists, and orators of Greece contended for popular applause. An immense concourse of people from the farthest isles and colonies of the Greeks came together. The assemblage was so great that the merchants came with their wares, and the games took on the aspect of a great fair such as is held at Nijni-Novgorod or Leipsic at the present time. The proclamation of treaties and other matters of importance to the Greeks were made at this time. The successful contestants were entertained at magnificent banquets, at which they were crowned with wreaths of wild olive, and such honor was paid to the victor and to his family that no effort was too great for a contestant to put forth in order to succeed. In Athens the victor was maintained at public cost for the remainder of his life.

The Olympics held so important a place in public estimation that the historians reckoned time in Olympiads. The first Olympiad began with the victory of Coroebus in the foot race of the year corresponding to 776 B. C.

In 393 A. D., Theodosius abolished the Olympic and other games, considering them un-Christian and for over fifteen centuries there were no Olympiads. Then in 1896 a "Modern Week of Greek Games" was arranged for, through the instrumentality chiefly of a learned Frenchman, the Baron de Coubertin, and Professor Sloane of Princeton. It was decided impracticable to hold these games on the classic Olympian plain, and instead the ancient Stadium at Athens was prepared for the purpose. A week of Olympic games was held at the Paris Exposition of 1900, at the St. Louis Fair of 1904, and again in Athens in 1906; at London 1908; Stockholm. 1912. and Antwerp, 1920. In these modern games, contestants from all parts of the world participated. The first of these modern Olympic games is naturally the most interesting. America was well represented, a team of five men being sent by the Boston Athletic Association, four men representing Princeton University, and one man, the Suffolk Athletic Club. On the afternoon of April 6, 1896, the king of Greece formally opened the Olympic Games. The Stadium, providing seats for 16,000 people, was filled to overflowing and people stood in throngs upon the surrounding hills. The chief feature of the games, which included many kinds of races and athletic contests, was the Marathon, a twenty-five-mile race on the last day. The Americans were sufficiently successful in the various contests to feel well repaid for their journey of 5,000 miles. Australia, England, and France had winners among their representatives. Greeks and Germans were foremost in gymnastic contests. An American, Ellery H. Clark, now a Boston lawyer, in 1897, and again in 1903 all-round athletic champion of America, won the broad and high jumps. Writing for the *Youth's Companion,* Mr. Clark says that as the time for the Marathon approached the excitement among the Greeks was so intense as to be almost painful. They seemed to feel that their national honor was at stake. From all sides came the cry, "The other events to the Americans; the Marathon to a Greek." Beside the usual crowds, the road leading to the Stadium was lined as far as the eye could reach with people watching for the first glimpse of the runners. It was estimated that 150,000 people were present, and when Spiridon Loues, a young Greek peasant, burst into the Stadium, the winner of the race, the mad joy of the audience, nine-tenths of whom were Greeks, created the wildest confusion, and those who did not rejoice with them must indeed have been few.

The Olympic Games of Ancient Greece, even after fifteen centuries, were still an active influence in 1896 when the New Games began. Although the movement may not be regarded as a literal revival of the old contests, it is in very truth a revival of

the old-time spirit, of lofty ideals, of national pride, and it is believed that it will "influence happily and gloriously the youth of the country, and through them the entire nation," and not one nation alone, but all nations, working not only for a higher physical and mental development but for unification and world peace.

"The King of Macedonia, it is said, was compelled to prove himself of pure Hellenic blood before he was allowed to compete at Olympia. The world is too big now for that sort or thing. All of us who love beauty, who have done no impiety or sacrilege, who believe in fair play and who have stout hearts, are Greeks in the highest sense."—George Horton.

The Isthmian games were celebrated on the Isthmus of Corinth. This isthmus was sacred to Poseidon, who received the appellation of Isthmius on this account. The festivals occurred the first and third year of each Olympiad, probably in the autumn. The contests took place near the temple of Poseidon. On one side of the temple were placed statues of the victors in these games. It was supposed that the Isthmian games were founded by Sisyphus, king of Corinth, in honor of Palaemon or Melicertes.

The Pythian games were celebrated in honor of Apollo, the conqueror of the Python. The festival was held near Pytho, subsequently called Delphi, in the Crissaean fields. According to tradition, Apollo himself instituted the Pythian games, which consisted originally of a musical contest only, held every eighth year. Later, the festivals occurred in the second year of every Olympiad, and included athletic sports and contests in the poetic art, in painting and sculpture, in tragedy, and in historical narrative. At first prizes of silver and gold were given, but later the laurel wreath and the palm branch were substituted.

The Nemean games were celebrated at Nemea in Argolis, the first and third years of each Olympiad. The victor was crowned with olive and, at a later period, with ivy.

See OLYMPIA.

Olympus, the highest mountain in Greece. It reaches an elevation of 9,794 feet. Its summit penetrates the clouds and is covered with snow during the greater part of the year. The Greeks considered Olympus the highest point on the surface of the earth—the center of the universe. Zeus and the other gods dwelt on it. Their palaces extended far into the heavens. The mansion of Zeus was situated at the highest point of all. It contained halls in which the gods assembled, visited, and held their councils. It was from Olympus that Zeus surveyed the progress of the earth and launched his thunderbolts. Later in the development of Grecian myth, the abode of the gods receded farther and farther into the heavens.

Olympus, the reputed seat
Eternal of the gods, which never storms
Disturb, rains drench, or snow invades, but calm
The expanse and cloudless, shines with purest day.
There the inhabitants divine rejoice forever.

Omaha, the largest city of Nebraska and the county seat of Douglas County, is on the Missouri River about midway between the northern and southern boundaries of the state and opposite Council Bluffs, Iowa, with which it is connected by several bridges. It is 55 miles from Lincoln, 500 miles west of Chicago and 600 miles east by north of Denver. Omaha is one of the great railway and distributing centers of the country and about one-third of the transcontinental freight and passenger transportation passes through it. It is served by fourteen lines of railway including the Chicago & Northwestern, the Chicago Great Western, the Chicago, Milwaukee & St. Paul, the Rock Island, the Burlington, the Chicago, St. Paul, Minneapolis & Omaha and the Union Pacific.

The railroad yards, factories and business establishments are found along the river. Most of the residences are located on the bluffs, and Omaha is noted for its homes. The city has twenty-one public parks, whose combined area is about 1,400 acres. They are so located as to be within easy reach of different parts of the city, and are connected by boulevards.

The important public buildings include the Federal Building, the Douglas County courthouse, the City Hall, the Auditorium, the Roman Catholic Cathedral, and a high school, costing $1,500,000. Omaha is the first city in the production of butter; the second live stock market in the world; the third agricultural implement center; the second corn market, and the first city

in the production of pig lead. The shops of the Union Pacific Railroad are here.

Among the institutions for higher education are Creighton University, (Roman Catholic), the University of Omaha, Bellevue College, Brownell Hall and the Medical School of the University of Nebraska.

A fur-trading station was established here in 1825, but the first permanent settlement was not made until 1854. The city was incorporated in 1857 and was the capital of the territory and state until 1864. When gold was discovered in Colorado, Omaha became the outfitting point for miners. The completion of the Union Pacific Railroad in 1854 greatly advanced the city's interest. Population in 1920, 191,600.

See PACKING HOUSE; NEBRASKA.

Omar Khayyam, ō′mer khī-yäm′, a Persian poet and historian. His name signifies Omar the tentmaker. According to tradition he lived during the latter part of the eleventh century. He appears in some way to have been able to obtain an education. He made a reputation as an astronomer. The Arabic ruler of Persia offered him a public position, but he requested instead the means of living and studying in private. He revised the ancient Persian calendar in 1074. He left a work on algebra; also a commentary on Euclid's geometry, both of which are extant. He is best known as a poet. He wrote in rhymed quatrains, reminding the student of Ecclesiastes. His quatrains, or rubaiyat, the native term, are supposed to have been about five hundred in number. The Moslem clergy considered him far from orthodox and took no pains to preserve his poetry, although they are credited with having put many of his lines and ideas to their own use. As a matter of fact, Omar bore about the same relation to the clergy of Persia that was sustained by Voltaire to the clergy of France. Many of his rubaiyat are, in fact, epigrams directed against the narrowness, the bigotry, and hypocrisy of the day. The rubaiyat have been collected by many scholars, particularly Edward Fitzgerald, an English orientalist. Like the proverbs of Solomon and Ecclesiastes to which reference has been made, they have little connection. The theme changes from quatrain to quatrain; from worship of Allah to defiance; from hope to fatalism; from rebellion to humility. See FITZGERALD, EDWARD.

Omnibus, a Latin word signifying for all. It is applied to a covered wagon designed to carry any who may choose to pay a fare. Under the shortened name of "bus," this sort of vehicle is a regular feature in railroad towns, where it plies to and fro between hotel and station, ordinarily at a charge of twenty-five cents for the round trip. The omnibus is said to have been an invention (1661) of Blaise Pascal, the eminent scientist of Paris, who amassed a moderate fortune from fares. The London omnibus dates from 1829; the New York vehicle, from 1830.

Omnibus Bill. See CLAY; FUGITIVE SLAVE LAW.

Onion, ŭn′yŭn, a bulbous plant of the lily family. It is thought that all varieties of onions under cultivation belong to the same species, and are due to differences in climate, soil, and management. The onion originated, it is thought, in Persia. It has been cultivated from antiquity in India and Egypt. It is one of our homeliest garden vegetables. Onions are propagated in three ways—by seeds, by sets, and by top onions. Seeds are obtained in the usual way during the second season. Sets are merely small onions obtained by sowing seed so thickly that the onions of the first season are exceedingly small, but start more quickly and grow faster a second season than plants from seed direct. Top onions are bulblets produced in place of flowers on the stalks of some varieties. Onions from seed are considered milder and more desirable for table use. The usual classification of onions is into onions that produce seed and onions that produce bulblets, or into seed onions and top onions. The last agricultural census reports 64,338 acres planted to onions in the United States. New York was for many years the principal onion-producing state in the Union, but is now third, being outranked by Texas and California. Bermuda onions reach the market early. They are considered the finest onions grown, and have a savory, very pleasing taste. The region about Laredo and Brownsville, Texas, has sprung into prominence in the production of this variety. The yield of

the principal onion-raising states for 1909 was:

State	Cars of 500 bus.
Texas	4,788
California	4,197
New York	3,889
Massachusetts	2,340
Ohio	2,137
Indiana	1,863
New Jersey	1,138
Michigan	574

The legal weight of a bushel of onions varies from state to state. In Ohio, the seller gives forty-eight pounds for a bushel. In Indiana, an adjacent state, the legal weight is fifty-six pounds.

See VEGETABLES; LEEK; GARLIC; LILY.

Ontario, the most populous province of Canada. The census of 1921 gave Ontario a population of 2,933,662, about one-third of the total for the Dominion. Nine-tenths of the people live in less than one-tenth of the province's area, in the region bounded on the north by the Ottawa River, Lake Nipissing and French River, on the south and east by lakes Erie and Ontario and the St. Lawrence River, and on the west by Lake Huron and Georgian Bay. This region comprises the original or old Ontario, as distinguished from New Ontario, which lies north of Lake Huron, Lake Superior and Rainy River. With an area of 407,262 square miles, Ontario is exceeded in size only by Quebec. It is almost exactly as large as the combined areas of Texas and California, the two largest states in the American Union. Both from east to west and from north to south it stretches nearly a thousand miles. Its easternmost point is farther east than Philadelphia, and its westernmost is a few miles west of Kansas City.

The bulk of the population is of British descent. Many of the English settlers were United Empire Loyalists, who left the United States during or immediately after the Revolutionary War. In the nineteenth century there was considerable immigration from Ireland and Scotland, and more recently from other European countries and from the United States. Particularly in the larger cities, Toronto, Hamilton and Ottawa, there has been an influx of immigrants who have found employment in these manufacturing centers. Ontario has a larger percentage of urban population than any other province—58.19 per cent, compared with 42.88 per cent in 1901. The ten largest cities, in order, are Toronto, 521,000, Hamilton, 114,000, Ottawa, 107,000, London, 61,000, Windsor, 39,000, Brantford, 29,000, Kitchener, 22,000, Kingston, 21,000, Sault Ste. Marie, 21,000, and Fort William, 21,000.

PHYSICAL FEATURES. Broadly considered, Ontario is a plain, crossed by two heights of land or ranges of hills. One of these heights extends northwest from Kingston, culminating in the bluffs on the north shore of lakes Huron and Superior; this range divides the streams that flow into the Great Lakes from those which flow into the Ottawa River and Hudson Bay. The second range or height is the Niagara escarpment which forms the elevation between lakes Erie and Ontario. Connecting these two lakes the Niagara River has worn the great gorge. The Niagara escarpment is continued through Bruce Peninsula and Manitoulin Island. Geologically the northern part of the province belongs to the surrounding pre-Cambrian Canadian Shield, surrounding Hudson Bay, towards which the surface slopes gradually. South of the Ottawa River the surface becomes slightly rolling, with low hills and shallow valleys to break the even surface. Along the shores of Lake Erie the land is low and flat again, rising gently to meet the Niagara escarpment. This southern region is drained into the Great Lakes-St. Lawrence system, the principal rivers, in addition to the Ottawa, being the Trent, Grand, Thames, Severn and French. Most of northern Ontario is drained northward by the Severn, which flows directly into Hudson Bay, and by the Atawapiskat, the Albany and the Moose, which flow into James Bay. In the extreme western part is the Rainy River, which flows westward into Lake of the Woods, and so becomes part of the Nelson system. Ontario has thousands of lakes of every size, the largest of which are Simcoe, Nipissing, Nipigon, Abitibi and Lake of the Woods. Many of them are the resort of fishermen and hunters.

CLIMATE. While these interior lakes have little effect on climate, the Great Lakes which comprise the largest part of Ontario's southern boundary, exercise a profound effect. They give the southeastern part of the province its characteristically mild climate, with summers not very hot and winters not very cold. At Toronto the mean summer temperature is about 65° F., and the mean winter temperature about 24°F. This part of Ontario, and more especially the Niagara peninsula, is one of the garden spots of the Dominion, famous for its grapes, pears, peaches, apples and other fruits. The farmers also raise hay, oats, barley and flax, but they feed most of their grain to hogs and cattle. The region is noted also for its dairy products. It produces about one-third as much cheese as the entire United States, and more than any state except Wisconsin. Butter, condensed and powdered milk, and honey are important products.

NEW ONTARIO. Northern Ontario, often called New Ontario because it has been only recently opened up by railways, presents considerable contrast. Out of reach of the modifying lake breezes, the extremes in temperature are greater, the air is much dryer, and the winters much longer. Along the shores of Hudson Bay the climate again moderates, and the winters are seldom as severe as in North Dakota, Minnesota and other northern states. Once it was believed that this region was not suited for farming, but it is known now that in the famous Clay Belt it contains millions of acres of fertile soil, where hardy crops do well.

FISHERIES. With the exception of Lake Michigan, all of the Great Lakes lie on Ontario's southern border, thus providing an opportunity for an important industry of the province. Trout, whitefish, herring and pickerel are most important, but eels, perch and catfish are taken in large numbers. The yearly catch is worth over $3,000,000.

MINING. Ontario has valuable deposits of practically all the common minerals except coal. The section north of lakes Huron and Superior constitutes one of the richest mining districts in the world. Sudbury is the center of the nickel mines, the only important deposit of this metal in North America. Porcupine district has one of the greatest gold mining regions in the world, and Cobalt district is famous for the largest silver mines in Canada. This silver is rich in cobalt, of which this district is the chief producer in the world. Copper is found on the shores of Lake Huron, and iron both on lakes Huron and Superior, and in the Rainy River district west of Lake Superior. Of the province's production of metals the figures for 1921 are as follows:

Gold	$14,000,000
Silver	$6,000,000
Nickel	$6,000,000
Copper	$1,600,000

The amount of gold has rapidly increased. Of the non-metallic minerals, the principal are natural gas and salt, both of which occur in the western part of the Ontario peninsula.

LUMBERING. Except Quebec, Ontario leads the Dominion in the production of lumber. The early settlers in southern Ontario had to clear away forest, and even now large areas of woodland remain. The trees of the south are chiefly birch, oak, maple, walnut and hickory, but in the north, in New Ontario, there are large stands of jack pine, spruce, hemlock, white and red pine and tamarack. The Canadian government has strict regulation. Commercial lumbering is centered on the upper Ottawa River and on Rainy River, west of Lake Superior. The yearly output of log and lumber products in manufactured form is not far from $40,000,000; the pulp industry is also important.

MANUFACTURES. Ontario possesses three advantages for the development of manufactures. It has almost unlimited water power, abundant raw materials and good transportation both by rail and water. These factors have made it the leading province in manufactures. The great single source of water power is Niagara Falls, from which, on the Canadian side alone, about 3,000,000 horse power may ultimately be developed. Probably 4,000,000 additional horse power can be developed from rivers in other sections. In view of the lack of coal within the province, this is a resource of prime importance. Its

utilization became a political issue about 1900, and since 1906 the province has had a hydro-electric commission which carries out the policy of governmental ownership and regulation.

Measured in dollars, lumber products, including sash, doors, shingles and wood pulp, are the chief products. There are iron and steel mills at various points, and during the World War this branch of industry jumped to a new importance. Shipbuilding is centered at Toronto, Collingwood and Port Arthur. Machinery of all kinds, agricultural implements, electrical apparatus, automobiles, carriages and wagons, furniture, paper and textiles are worth note. While manufacturing is naturally centered in the larger cities, the abundance of water power has resulted in the erection of factories in many smaller communities, whose output is a considerable part of the total.

Transportation. In the development of Ontario's manufactures transportation has played a great part. First of all has been the Great Lakes-St. Lawrence system, which has facilitated trade at home and provided an avenue for export. The chief exports (mostly to the United States and Great Britain) are copper, silver, nickel, gold, lumber, wood pulp and railway ties and agricultural produce of various kinds. The numerous canals and the 12,000 miles of railway have been added to the natural waterways.

Government and Education. The provincial government follows the lines laid down by the British North America Act. The lieutenant-governor, appointed by the governor-general-in-council, holds office for five years. He is the titular head of the government, but the real head, as in any system of responsible government, is the premier, who is responsible to the majority in the provincial legislature. The premier is assisted by an executive council or cabinet, of eight or more members, who are the heads of the executive departments and are also members of the legislative assembly. The latter comprises 111 members. The provincial supreme court, or high court of justice, is divided into three branches, the king's bench, common pleas and chancery. There is also a court of appeals, to which cases may be taken from any of these branches. District and county judges, and police magistrates in the cities, have limited jurisdiction. Local government follows the general lines of local government in the United States, the provinces being divided into counties, and these into townships. In New Ontario, however, there are still sections which have not been completely organized; these are called districts.

Ontario has one of the best public school systems in North America. The schools are supported partly by local taxation and partly by provincial grants. Attendance is free and compulsory. Under special conditions Roman Catholic or Protestant separate schools may be established, but the great majority of the children attend nonsectarian schools. The province maintains several county model schools, seven normal schools, and the Ontario College of Education, which is a faculty of the University of Toronto. Special institutions are the agricultural college at Guelph, a dairy school and a school of mines at Kingston, a school for the deaf and dumb at Belleville, and one for the blind at Brantford. The University of Toronto, the provincial university of Ontario, stands at the head of the public school system, and most of the sectarian colleges in Ontario are affiliated with it. The leading endowed institutions are Queens at Kingston, McMaster at Toronto, and Western University at London.

History. The history of Ontario does not begin officially until 1791, when Upper Canada, as it was then called, was set up as a province. At that time the majority of the settlers were United Empire Loyalists, who had left the United States because they preferred to remain British citizens. During the Revolutionary War and the War of 1812 attempts were made by the Americans to conquer this section. The battles of Queenston Heights, Beaver Dam, Stoney Creek, and Lundy's Lane, in the War of 1812, are specially notable. Then for a generation there was political strife, which broke into open rebellion in 1837, when the reformers led by William

Lyon Mackenzie, took up arms to enforce their demands for responsible government. The rebellion cost Ontario its separate existence, for it was united with Quebec under the Act of Union of 1841, and did not emerge again as a separate province, under the name Ontario, until 1867. As a province of the Dominion of Canada, Ontario has had several disputes with the national government over such matters as provincial boundaries, control of liquor licenses, and riparian rights, and has been regularly successful in its defense of provincial privileges.

Under the Confederation Ontario has shared in the great advance in material prosperity which Canada has enjoyed. Along many lines Ontario has been the leader. The World War intensified this advance, at the same time that it partially checked it, for organized industry gave effort to the prosecution of war activities, to the extinction of normal peace-time work. Prohibition was adopted in 1916 as a war measure, and women were given the ballot in the next year.

Economic problems have played a large part in provincial politics. The organization of the hydro-electric commission in 1906 for the purpose of acquiring ownership of the Niagara Falls power stations and of controlling the distribution of all other power was really the result of a Conservative victory at the polls. The enlargement of the province in 1912 was followed by the construction of the Timiskaming & Northern Ontario Railway, a government enterprise, and the settlement and industrial development of New Ontario. In 1921 the Farmers' Party was returned to power on a platform calling for the continuance of complete prohibition.

Area, square miles	407,270
Population	2,933,662
Membership in House of Commons	82
Membership in Dominion Senate	22
Miles of railway	12,000
Average value of farm products	$1,000,000,000
Potential water power (h. p.)	7,000 000
Developed water power (h. p.)	1,000.000
Gold production	$10,000,000
Silver production	$15 000 000
Lumber production	$40,000.000
Nickel production (40,000 tons)	$80,000 000
Copper production maximum)	$30,000,000
Largest forest reserve (Nipigon) sq. mi.	7,500
Capital invested in farms	$2,000,000,000
Average hay crop, tons	5,000,000
Manufactured products	$2,000,000,000
Total mineral production	$70,000,000

Ontario, Lake, the smallest and the lowest of the Great Lakes of North America. It lies below the Falls of Niagara. It forms a part of the boundary between New York and the province of Ontario. It is oval in shape. The extreme length is about 185 miles; the greatest width, sixty miles. The area is about 7,400 square miles. The surface is 334 feet below that of Lake Erie and 231 feet above sea level. Its greatest depth is 600 feet, which locates the bottom 369 feet below the surface of the Atlantic. The lake is subject to swells and storms that prevent its freezing over in winter. By breaking ice in the harbors in midwinter, navigation is kept open throughout the entire year. There are several good harbors. Toronto, Kingston, Newcastle, and Niagara are the principal Canadian ports. Oswego, Genesee, and Sackett Harbor are the chief ports on the New York side. The lake receives the waters of the upper lakes, through the Niagara, and discharges at its northeast corner by a channel called the Lake of a Thousand Isles through the St. Lawrence. See NIAGARA; WELLAND CANAL; ST. LAWRENCE.

Onyx, ō′nĭks, a term applied to two quite different stones. The first is a variety of quartz, closely allied to agate. It varies in color from white to black, brown, or red.

The world's choicest supply comes from Algeria. There are fallen forests of petrified trees in the United States. See PETRIFIED FOREST.

Ooze. See GLOBIGERINA.

Opal, a well known mineral. It is composed chiefly of silica. It differs from quartz in that it contains from three to ten per cent of water. It varies greatly in appearance and quality. The lustre may be glassy, pearly, or resinous. In color it may be white, red, yellow, green, gray, or blue. The best effects are obtained from a rounding surface, so the opal is left uncut. The fire opal of hyacinth red is found in Mexico. It was a favorite gem of the Aztecs. A bluish opal is also found

in Mexico and Central America. A more common opal, lacking somewhat in beauty, is found in Pennsylvania, Colorado, and California. A forest of fossilized wood having the appearance of opal was found in Montana in 1903. The most noted opal gem is possessed by the crown of Austria. It is guarded with the royal jewels at Vienna. It is a flashing Hungarian stone two and one-half inches in diameter. See QUARTZ.

Open Shop, a term applied in recent years to an industrial establishment, business, factory or plant, in which either union or non-union workmen may be employed, but in which, usually, the hours and wages prescribed by the trade unions are observed. The term is also applied to the industrial policy under which such establishments are so managed; thus we say that "the open shop" is gaining in favor in a certain city, or that a certain manufacturer maintains an open shop.

The open shop policy is bitterly opposed by union labor, which in the United States is largely dominated by the American Federation of Labor. It is invariably condemned by labor representatives as inimical to their interests; but it is supported by many employers who desire to operate their plants without interference from labor leaders or dealing with labor unions exclusively. In several large cities of the country, of which Seattle and Indianapolis may be cited as examples, there has been a determined effort in recent years to secure the general adoption of the open shop policy in industry of all kinds. Such efforts have usually come about as a reaction from the difficulties and public inconvenience caused by strikes of organized labor.

Under the open shop plan of operation there is usually no objection to the employment of union men as individuals, but the employer may refuse to recognize the union or to employ union men exclusively, and makes individual contracts for labor instead of negotiating with organized labor for the settlement of wages and working conditions. Non-union men are freely employed, and in some cases the plan has been found to work fairly well, although there is almost invariably a continuous effort on the part of labor unions to change the plan and secure the unionization of the establishment at the first opportunity. The most important example of the open-shop policy is found in the works of the United States Steel Corporation, which has consistently refused in recent years to give recognition to labor unions, or to deal with its employees in any other way than as individuals. Many attempts have been made under the auspices of the American Federation of Labor, by means of strikes and otherwise, to unionize the steel workers, but with only partial success to date (1923) so far as the men themselves are concerned, and no success at all in securing the assent of the corporation to any change in its established policy of the open shop.

The American Newspaper Publishers' Association is one of the national organizations of employers that supports the open shop idea. A report made to the association at its annual convention in April, 1923, stated that there were then 56 large newspapers in the United States operating open shops, 18 of these being non-union shops, while the remainder were open to union and non-union men without discrimination in favor of either class. The open shop division of the publishers' association was created in 1922, and during its brief existence the report stated that the division had been of material benefit to a number of employers of union labor, enabling them to make more advantageous contracts with the unions, and in some instances had undoubtedly prevented strikes.

Opera, a form of drama in which music is an essential factor. The dialogue is usually sung in opera, the music being varied and elaborate. The modern opera was developed in Italy near the close of the sixteenth century. Its origin is not widely separated from that of ordinary drama. The musical recitation of the rhapsodes among the ancient Greeks doubtless marks its historical beginning. In the Miracle Plays of the Middle Ages music was usually an accompaniment of the dialogue. In its modern form, the opera offers opportunity for every variety of musical effect. It has reached greatest perfection in Germany. Among celebrated writers of opera are Mo-

zart, Handel, Glück, Meyerbeer, Rubinstein, and Paderewski, but, above all, the German Wagner. Grand opera is a name given to lyric opera performed in an elaborate manner. French musicians, however, have established an arbitrary class of operas to which they give the name of grand opera. The finest opera house in the world is the Grand Opera of Paris. Thirty-three varieties of stone are employed in interior decoration. See DRAMA; COMEDY; TRAGEDY; ORCHESTRA.

Opera Glass. See TELESCOPE.

Ophelia, in Shakespeare's tragedy of *Hamlet,* the daughter of Polonius. She is in love with Hamlet and when he, in madness, kills her father, Ophelia's reason is overthrown. After various pathetic scenes she is drowned while gathering flowers.

Opinion, the decision of a judge on a question of legal import. Formerly, judges habitually delivered their opinions orally, but in late years they have established the precedent of handing in written reports. In the United States, any judge may issue an opinion, while in England only those of law lords delivered in the House of Lords are acceptable. If a judge in his opinion includes incidental matter not pertaining to the case at hand, it does not affect that particular instance, but may go down in the records as a future law, which lower courts may follow.

According to the statutes of many of the states, the mayor or any other public officer may call upon a legal authority for an opinion on a matter upon which the laws either are not very clear or have become extinct.

Another form of opinion is that issued by an attorney to his acknowledged client. These decisions are, of course, purely advisory and personal in character, and have no weight in either the United States or England as far as the judgment of the court is concerned.

Opium, the dried juice of the seed pods of the common garden poppy. The poppy has a milky juice, a disagreeable smell, flowery foliage, and gorgeous flowers that fall to pieces under the touch. "The capsules, seed pods, are curious from the manner in which they fling out their seeds when shaken by the wind; each capsule being somewhat like a round or oval pepperbox with holes, however, not on the top, where rain might get in, but under the rim." An agreeable oil, pressed from the seeds of the poppy, is used as a substitute for olive oil. To collect seed, it is necessary to harvest and dry the stalks in an upright position. They are then inverted, when the seeds run out of the pods and are caught on a canvas. Poppies are cultivated, for the sake of opium chiefly, in the valley of the Ganges, in Asiatic Turkey, in Egypt, and in Persia.

The Ganges poppy region is a small district 400 miles long and 100 miles wide When a fair proportion of the poppy heads is full sized but not ripe, which for India is in February, the opium harvest is at hand. The native laborers go through the fields in the dewy morn, wounding the poppy heads with a notched instrument such as would be formed by cutting a steel saw into pieces of two teeth each, and binding four of these pieces together to make what a boy would call a "jabber." During the sultry day a milky sap oozes out of the punctures and collects in drops. Early each morning collectors go along the rows and scoop off these drops into a vessel hanging at the workman's girdle. Returning home, the juice is transferred to a shallow brass pan which is tilted to allow any water to drain off. In three or four weeks the sap has evaporated to the consistency of dough, and is sold to a government factory where it is thrown into a vat large enough to hold the product of a district. The opium is now kneaded and worked into balls. These balls are covered skillfully with poppy petals, carefully pasted and glued and adapted to the surface. Each ball is deposited in a brass cup, which, indeed, has been used during the process of covering; the cups are placed in trays, and the trays are placed in racks in a vast drying room. These precious balls are turned every day, as if they were small cheeses, and examined with care to see that no harm is taken from insects or mold. When dried, the balls are packed in chests for market. It may be seen readily that opium is an expensive article, but the demand is so great that opium exceeds every other drug in commercial importance. By actual weight it

is the most extensively sold drug in the market. In 1904 our drug trade imported opium to the value of $2,500,000.

In addition to its legitimate use as a powerful medicine, opium is used habitually by the natives of China and the eastern archipelago. It is consumed by placing a pellet the size of a pea in an opium pipe. The pipe is lighted by application to a flame, and the opium is inhaled by a single long drawn whistling breath. Opium dens are maintained by the Chinese in many of our large cities. Those of San Francisco were especially notable before the great fire of 1906. China raises considerable opium, and imports $25,000,000 worth annually. Laudanum is a tincture of opium,—one part of opium to five parts each of water and alcohol. An overdose is a deadly poison. Morphine is one of the ingredients of opium. When extracted it is a white crystalline powder.

The production of opium in India is a government monopoly. There is agitation against production for smoking. The United States Department of Agriculture is experimenting with a view to the home production of morphine. It can be made from a cheap grade of opium.

Oporto, ō-pōr′tō, the chief seaport of Portugal. The name is Portuguese, meaning the port. It is situated on the northern bank of the Douro River, three miles from the Atlantic. The river is spanned by a railroad bridge of open iron work. The principal arch has a span of 520 feet, and is 195 feet high in the clear. A foot and vehicle bridge of similar construction has a span of 566 feet and a height of 200. The site is precipitous, giving the city and streets a quaint, terraced appearance. The principal buildings are a fine Gothic cathedral and the archbishop's palace. A granite tower 200 feet high commands a magnificent view of the ocean. It can be seen far out at sea. An old monastery has been converted into an English club house. The floors and walls are inlaid in striking devices with rich woods from Brazil. The city is noted for shipments of port, a wine taking its name from that of the city. Genuine port comes from a district sixty miles up the river, having an area twenty-seven miles in length and five or six in breadth. Port is a favorite wine, especially with English-speaking people. Other important exports are oranges, onions, and olives. Cork of excellent quality is exported. Portuguese sumac is in demand for tanning. The present population of the city is about 204,000.

Opossum, an American animal of which an early traveler wrote, 1670, that the female "hath a bag under her belly out of which she will let forth her young ones and take them in again at her pleasure." There are a score of species in the two Americas, varying in size from a chipmunk to a large cat. An occasional specimen of the smallest species arrives in this country from Central America. It comes as a stowaway hidden in a bunch of bananas. The common or Virginia opossum ranges from New York to California and southward. It is about fifteen inches long with an additional allowance of twelve inches for tail. Some naturalists claim that the Pacific coast form is a distinct species. The opossum is a tree-loving animal, climbing about from bough to bough chiefly by the aid of its hand-like feet and a scaly tail. It wraps its tail around a branch and seems to enjoy hanging head downward. Its fur is yellowish, with darker long hair. Its ears are black and leathery. Its teeth are fitted for eating insects, small animals, and berries. Like the raccoon, it feeds chiefly at night. On the ground the opossum moves about sluggishly, like a porcupine, making a track suggestive of a "small deformed human hand." If overtaken, it feigns death or sleep and may be spurned with the foot or beaten with a stick, but it refuses to come to life until its enemies have gone away, when it revives slowly and with many a furtive glance of precaution. This ruse is quite successful, for even a dog refuses to worry a "dead" possum. This is the habit that has given rise to the saying "playing possum."

Burroughs writes entertainingly of a tame possum that acquired sufficient courage to grin at him in "a sort of comical, idiotic way," and had to be sent off to shift for itself on account of a troublesome habit of climbing about his bookcase inspecting books. "One day in March," says he, "one of my neighbors brought to me

1.

2.

3.

4.

5

1. Long-nosed pouched badger. 2. Opossum. 3. Pouched martin 4. Jumping mouse. 5. Pouched wolf.

OPOSSUM AND OTHER POUCHED ANIMALS.

a handful of young possums, very young, sixteen of them, like newly born mice. The mother had been picked up dead on the railroad, killed, as so often happens to coons, foxes, muskrats, and woodchucks, by the night express. The young were in her pouch, each clinging to its teat, dead. The young are carried and nursed by the mothers in this curious pocket till they are four or five weeks old, or of the size of large mice. After this, she frequently carries them about, clinging to various parts of her body, some with their tails wound around hers."

In autumn, the opossum, like the woodchuck, takes on a covering of fat for use in winter months when food is scarce. Baked and garnished with sweet potatoes, the opossum is considered excellent eating. Although a tree climber, the opossum feeds chiefly on the ground, and makes its den in a hole beneath the roots of a tree.

See DUNBAR; KANGAROO; GESTATION.

Optic, Oliver. See ADAMS, W. T.

Oracle. See DELPHI.

Orang-Utan, a manlike ape found in the forests of Borneo and Sumatra. The male attains a height of possibly four feet, and stands erect in a constrained position with its long arms almost touching the ground. The name is Malay, signifying man of the jungle. The orang walks on all fours, with a gait resembling that of a person hobbling forward on crutches. It is too heavy to jump from branch to branch, but it swings itself in tree tops with grace and great agility. The feet, hands, and face are bare. The rest of the body is covered with scanty reddish hair. The orang-utan feeds chiefly on fruits and the succulent shoots of trees. It descends to the ground for water. It builds large nests in tree tops, and is quite inoffensive, though defending itself with ferocity when brought to bay. The orang is about two-thirds as large as its African relative, the gorilla. It has brick red hair. The gorilla is black. Mr. William T. Hornaday writes:

In captivity young orang-utans are as affectionate as human children, and very fond of their human friends. In the jungles of Borneo the full-grown males often fight savagely by biting each other's faces, and by biting off fingers and toes. At night the orang makes a nest to sleep upon by breaking off leafy branches and laying them cross-wise in the forked top of a sapling. On this huge nest-like bed it lies flat upon its back, grasps a branch firmly in each hand and foot, and is rocked to sleep by the cradle-like swaying of the tree top.

Unless attacked at close quarters in their forest homes, none of the great apes is dangerous to man. All of them flee quickly from the dreaded presence of Man, the Destroyer. They never fight with clubs, but when attacked at close quarters they bite, just as do human roughs. When enraged, the gorilla does beat its breast with its fists, just as Du Chaillu said; and it does this even in captivity.

Place upon the shoulders of a gorilla the head of a chimpanzee, and we would have—what? The Missing Link, no less—a hairy, speechless man! The man-apes we have. Let those who seek the undiscovered ape-man search the Tertiary deposits of the fertile uplands that lie between the gloomy equatorial forests of the black apes and the Bushmen of South Africa; for there, if anywhere, will the Missing Link be found.

Orange, ŏr′ĕnj, a shrub or small tree closely related to the lemon and citron. The varieties under cultivation are from a common stock thought to be native to tropical Asia. California navel oranges are seedless and have a second series of cells, a sort of fruity, top-shaped core in the center of the tip. This orange originated at Riverside from trees obtained from Brazil through the agricultural department at Washington. Tangerines are a small orange from China. They have a reddish, baggy, easily removed rind and sweet pulp.

Orange trees are said to attain an age of one hundred fifty years. Old trees yield more freely and produce fruit with a thicker rind and sweeter pulp than young trees. Orange wood is yellow, hard, and close grained, well adapted to fine carpentry and inlaid work. The leaves are oval and evergreen. The flowers are of a pure white and have a penetrating fragrance. In the countries of southern Europe orange blossoms have been used from time immemorial as bridal wreaths. Botanically, the fruit is a large berry, having eight or ten cells filled with a more or less acid, juicy pulp. The skin contains considerable citric oil.

The orange region of Europe extends from Malta to the Azores, including Spain, Portugal, Italy, and southern France. Orange trees are obtained by planting seed and by grafting or budding the seedlings, as in the case of apple trees. There are three orange regions in the United States,—Florida, the Delta of the Mississippi, and

California, with hopes of Arizona and adjacent territory. Florida had almost driven foreign oranges out of our markets when the freeze of 1898 killed the plantations as far south as Tampa, entailing a loss of $100,000,000. The annual output grew from 600,000 boxes in 1885 to 6,000,000 the year of the freeze, but fell off at once to 100,000 boxes. California oranges are of excellent quality, and hold the western field well. Few European oranges leave the Atlantic coast. The latest statistics give 22,500,000 boxes as California's annual orange production, and 8,200,000 boxes as Florida's, the whole crop valued at $63,850,000. Oranges are shipped to market in slat cases divided by a board into two compartments, each practically a cubic foot in shape and capacity. Each orange is cut from the tree with a knife or scissors. The oranges roll down a cloth-bottomed trough between brushes that clean and burnish them. They are run through a slatted trough to sift or sort them by sizes. Each orange is wrapped in tissue paper. They are packed with great regularity, just so many in a row, and an exact number of rows and layers according to the size of the orange. Each box is marked with the name of the grower or packer, and the size, that is to say, the number of oranges in the box.

Seventy per cent of the citrus fruit of the state is marketed by the California Fruit Growers' Exchange, a coöperative association that has outlived several disasters and reorganizations. There are ninety-six local associations composed of local growers. Each has its packing house. These local associations are grouped in fourteen districts, representatives of which constitute the Exchange with headquarters at Los Angeles. The Exchange serves its members in many ways, but chiefly in fixing each year the wholesale price of oranges, and in regulating freight charges; in icing cars, crating and packing oranges; and in a dozen other ways—all consequent upon getting the oranges on the market and gaining all possible advantages for the members.

A standard California orange orchard, that is, the individual grower's orchard, has an area of about ten acres. It is impossible to give the average value of such an orchard, because values are conditioned by quality of land, proximity to markets, age of trees, state of farm improvement, etc. Ordinarily, an acre of orange trees yields four hundred boxes of fruit—one car. The cost of production is distributed among such operations as cultivating, pruning, spraying, heating to prevent frost-kill, irrigating, picking and hauling.

Orange, N. J., the original settlement in the state, was founded by colonists from Connecticut in 1666. By growth and division it has become four cities—Orange, East Orange, South Orange and West Orange — whose combined population in 1920 was about 106,600. Each of these cities is a residential suburb of New York. Orange was originally a part of Newark. It is a beautiful residential city.

Orange, Prince of. See WILLIAM THE SILENT.

Orange Free State, a British colonial possession of South Africa, since 1910 a part of the Union of South Africa. The province has an area of 50,389 square miles and has 628,360 inhabitants, about 190,000 of whom are white. Orange Free State is bounded by the Vaal River, north; Basutoland and Natal, east; Orange River, south; and Cape of Good Hope Province west. The capital, Blomfontein, had 38,865 inhabitants in 1921.

The surface of the colony is a broad, undulating plateau with an elevation between 3,000 and 4,000 feet above sea level. In the east and along the rivers are found the only wooded regions; for the rest it is grass-covered. The rainfall averages 25 inches annually, and the climate is dry and very healthful. The herbivorous animals that once roamed this plateau have disappeared.

The Orange Free State was, until the middle of the last century, the home of semi-nomadic bands of black people, but the territory was taken over by the Boers, who migrated from Cape Colony, on the south, about 1836. This migration northward is commonly referred to as the "Great Trek." The Boers founded the Orange River Colony; in 1848 the British claimed possession, and the colony was declared independent in 1854 and was named the

Orange Free State. In 1899 war broke out between the Transvaal, which is north of the Orange Free State, and Great Britain, and the Free State joined forces with the Transvaal. The Free State was overrun, Transvaal was defeated, and in 1900 the Orange Free State was annexed to the British Empire as the Orange River Colony. Then its real development began.

The principal industry is and has always been stock raising, for which the colony is eminently suited. Cattle and sheep are raised in great numbers, and thousands of dollars worth of hides and wool are exported each year. Agriculture is engaged in to some extent, the chief crops being wheat, oats, corn, potatoes and tobacco. Coal is mined in the colony, diamonds are found, and there are small deposits of gold, tin and lead.

At the last census there were 742 public and 113 private schools with 56,191 students enrolled. There is a normal school, a polytechnic college and a government industrial school for boys. The Dutch Reformed Church has the greatest number of communicants, and is followed by the Wesleyan and Anglican churches. See UNION OF SOUTH AFRICA.

Orange River, (Hottentot, *Gariep, great water*) the longest and most important river of South Africa, was discovered early in the eighteenth century by Dutch settlers in Cape Colony, and received its present name in 1777. The source of the Orange is in the Drakenberg Mountains on the border between Natal and Basutoland and about 120 miles from the Indian Ocean. Hence it flows southwestward for some distance, forms the southern boundary of the Orange Free State, flows across the northern part of Cape of Good Hope Province, forms the boundary between the latter and former German Southwest Africa and, having flowed more than 1,300 miles, empties into the Atlantic Ocean. Its drainage basin is approximately 400,000 square miles in extent.

There are many scenes of great beauty along the Orange—high, steep banks, rapids, islands and falls succeeding each other in delightful succession. The Vaal is the principal tributary.

Orangemen, a secret society of Irish Protestants organized in Ireland in 1795, and named in honor of William III, Prince of Orange, who ascended the English throne in 1689. Frequent conflicts between Orangemen and Catholics led to the suspension of the order in Ireland from 1813 to 1838. Societies were formed in England, Canada and the United States. In 1828 it was estimated that there were over 200,000 members, but the membership in America has fallen off since that time.

Orang-Utan (in the Malay language called the "man of the woods") is a man-like, or anthropoid, ape that inhabits the jungles of Borneo and Sumatra. A full-grown male orang rarely exceeds 50 inches in height. The distinguishing features of this animal are its long arms; the height of the cranium, the highest among the apes, and affording room for a brain that is next to man's in size; and the red-brown coarse hair that covers the body. The arms of the orang when hanging down reach almost to the ankles; they are extremely muscular and are important aids to locomotion when the animal is on the ground, and almost the sole means when it takes to the trees. In walking, the sides of the feet and the knuckles of the hands, are placed on the ground. The orang never walks in the upright position without support.

While it is believed that the orang-utan was once native to Asia, it is now found only in Borneo and Sumatra. The animal has few natural enemies; large serpents and crocodiles are the most dangerous, but the orang is not afraid of these nor of man. This ape is arboreal in habit, and is a strict vegetarian, subsisting on leaves and fruits. An orang has not the marvelous agility of the gibbon and is rather slow and deliberate in its movements. It builds a nest of small branches and leaves at a height of from 30 to 40, rarely 50 feet above the ground. It goes abroad only in the day, and then only after the sun has dissipated the cold mists of the swampy forests in which it lives. Investigators say that the orangs are almost always found singly or in pairs, seldom in large bands. If taken young, this animal may be trained, and displays great intelligence.

Oratorio, a sacred musical composition, including arias, choruses and interludes to be performed with orchestral accompaniment. The oratorio is longer and more elaborate than the cantata, it is more dignified than the opera and while somewhat dramatic in treatment is performed without acting, costumes, or scenic effects. The oratorio grew out of the Mysteries and Miracle Plays, but all that in those early presentations could offend cultivated taste or detract from the sacredness of the divine events which furnish the themes, is omitted in the modern oratorio. Some of the most celebrated oratorios are *The Messiah* by Handel, *The Creation* by Haydn and *Elijah* by Mendelssohn. See MIRACLE PLAY; OPERA; CANTATA; HANDEL; HAYDN; MENDELSSOHN.

Orbis Pictus. See COMENIUS.

Orchard, a plantation of fruit trees. An orchard may consist of one kind of fruit, as an apple orchard, peach orchard, plum orchard; or it may include several different kinds of fruit trees. The memory of the orchard with its fragrant blossoms, robins, orioles, bluebirds, and fruit, is a part of a child's rightful heritage. Cultivation is often offset by planting hoed crops. By way of distinction, small fruits, as raspberries, etc., are raised in gardens; or, if on an extensive scale, in fields; grapes in vineyards, and so on. According to the United States census in 1899 the total number of fruit trees in orchards was 367,164,694, the yield being valued at $83,751,840.

Orchestra, ôr′kĕs-tra, a company of musical performers playing as a band in concert. The notion of orchestral music is modern. Instrumental music was at first an accompaniment of the voice or body. Instrumental music, apart from singing, dancing, or marching, was not accepted generally before 1600. The combination of various instruments, and especially instruments as different as a violin and a drum, was a later development again. Band or orchestral music did not gain a footing until about 1800. A full orchestra now includes stringed instruments, wind instruments of brass, wind instruments of wood, and instruments of percussion. A recent writer describes a well balanced classical orchestra of fifty-three pieces as made up of:

STRINGED INSTRUMENTS:
- 10 first violins.
- 10 second violins.
- 8 violas.
- 6 violoncellos.
- 6 double-basses.

WOOD WIND INSTRUMENTS:
- First and second flutes.
- First and second oboes.
- First and second clarinets.
- First and second bassoons.

BRASS WIND INSTRUMENTS:
- First and second horns.
- First and second trumpets.

INSTRUMENTS OF PERCUSSION:
- A pair of kettledrums.

Orchestral combinations are almost infinite in number. Two instruments, for example, may be played in unison, or in octaves, or in intervals; first one may take the high part; then, the other; giving four possible combinations for two instruments. Add a third instrument and the number of combinations is increased. The number of combinations possible with an orchestra like the one described is almost beyond computation. Then again, almost the entire orchestra may play an important figure while a few play accompaniments; or, by reverse, a single instrument may carry the burden in its brightest tones while all the rest play in soft, veiled tones. Groups are frequently made to answer each other,—strings against wood-wind, or wood-wind against brass-wind; or wood instruments massed against the string band.

Lavignac, a professor of harmony in the Paris Conservatory, calls attention to the similarity of sound and color, and likens the effect of orchestral music to that of a pattern or picture in many colors. The placid, poetic flute, in his judgment, produces a sensation like that of a blue sky; the rustic oboe gives green; the warm, rough, yet velvety clarinet—brilliant when high, solemn when low—yields red brown, vandyke red, and garnet; the horn is coppery yellow; the family of trumpets shows all gradations of crimson; the braggart cornet sound has a pale red color; the sad bassoon is dark brown; drums make masses of black; the triangle is silvery; while the violin color changes like a kaleidoscope.

Orchids, ôr′kĭdz, a remarkable family of perennial herbs, shrubs, and climbers. The distinguishing feature of the family is the flower, which goes to the extreme of irregularity, culminating in a fleshy stigma and stamen so arranged that an insect, as a bee, exploring for honey, carries away a sticky pollen mass from the stamen on its shoulders and rubs it on the stigma of the next flower visited. Our native orchids include the arethusa, calopogon, and pogonia, the choicest treasures of our bogs. The orchis, the rein-orchis, and the incomparable lady's slippers belong here. The long, twisted spikes of fragrant, waxy lady's tresses, the humble twayblade, the homely coral root, and the charmingly threatening adder's mouth all belong to this family.

Of hothouse orchids there is no end. The basket-climbing orchids of a large conservatory or plant garden, such as may be seen in Garfield and in Lincoln Park, Chicago; in Shaw's Gardens, St. Louis; in Washington, New York, Philadelphia, Boston, San Francisco, and most of our large cities, are tropical marvels of color and fragrance.

In tropical countries the orchids grow from the bark of trees or from rocks. Their roots merely hold the plant in position without reference to nourishment from the soil. Tropical orchids, therefore, are air plants. In temperate regions the orchids are herbs, or even shrubs, growing in the ground. There are about 5,000 species in all. Members of the family are distributed all over the habitable globe, but the house plants come chiefly from three regions—tropical America, India to Australia, and southern Africa.

Orchids are very capricious as to the place where they grow. One species, known as the "Flower of the Gods," is found only on Table Mountain on the Cape of Good Hope in South Africa. It grows nowhere else on earth. It is confined to a half mile circle on that flat-topped mountain itself. Another orchid is found only on the stone cliffs of Farther India. Some of the orchids seem exceedingly freakish in shape. One imitates the elephant moth. To the passer by, the flower looks like a moth hovering in the jungle. The butterfly orchid represents a butterfly faithfully, even to the detail of having antennae. Another orchid has a ludicrous resemblance to a black-breasted penguin sitting on its tail. At Panama the early Spaniards found an orchid which they held in reverence because it suggested to them the Holy Dove descending on Christ's head at His baptism in the Jordan. As a family the orchids are fragrant. Some have a heavy odor; the perfume of others is as delicate as that of a violet. The seed pods of an orchid contain millions upon millions of brown seeds, so fine that they are carried before the breath like the lightest dust. It seems impossible that gorgeous plants should spring from so minute and insignificant a source.

See Arethusa; Lady's Slipper.

Orcus, ôr′kŭs, in Roman mythology, a name of the god of the lower world. Dis, or Father Dis, is another name given to the same god, although originally Orcus was rather the slayer, or angel of death; while Dis ruled the shades in the abode of the dead. The name Pluto was also in common use among the Romans to designate this god. The name and character of Orcus have descended to a sort of forest elf appearing in folk lore tales. He is a black, hairy monster who delights in making a meal of a good fat child, but is occasionally friendly and helpful to lost children who stumble upon his dwelling. The Italians call him an orco; the Spanish an ogro; the English an ogre.

Ordeal, a form of trial to determine guilt or innocence. It consisted in testing the effect of fire, water, poison, etc., upon the accused. The ordeal grew out of nature worship. It was based on a primitive belief that the supernatural resided in and manifested itself in nature and in natural agencies, and hence that innocence was proof and could come to no harm. The trial by ordeal of middle and western Europe was a survival of savagery. Indeed, ordeals of various kinds are practiced yet in the remote districts of China, in the Congo Valley, on the Guinea coast, in Senegambia, and elsewhere. In Siam it is said that the accused and the accuser were, until of late at least, exposed to the attack of a tiger. If one was taken and the other left, the tiger was considered to have taken the

guilty party. If he took both victims, both were considered guilty, and anyhow the affair was over. Travelers relate soberly that the Zambezi native, who does not feel well —the rheumatism possibly—and who suspects that he has been bewitched, sends for the witch doctor. The latter, with due ceremonial, brews an infusion of a native purgative plant. The wives are drawn up in line and each, holding her hand up to heaven in protestation of innocence, takes the prescribed draught. Those who vomit are considered innocent; the club for the rest. An equally scientific method of administrative justice is practised by the natives of Madagascar. The authorities prepare a decoction of a poisonous fruit to be administered to the supposed criminal. A small portion is harmless and a large one fatal. As the authorities have it in their discretion to determine the size of the dose, excellent results are obtained.

As practised among the Germans and the Anglo-Saxons of historical times, however, we must believe that there was faith that Providence would shield the innocent, and that they would be scathless, even as Shadrach, Meshach, and Abednego walked in the fiery furnace of Nebuchadnezzar and came forth, "Upon whose bodies the fire had no power, nor was an hair of their head singed; neither were their coats changed, nor the smell of fire had passed on them."

A common form of the water ordeal was the casting of the accused, bound hand and foot, into water. He was considered guilty if he floated, and innocent if he sank. In the latter case he was to be rescued. In the ordeal of fire the accused was dressed in a garment of waxed cloth and made to pass through fire. If he were unhurt and the wax unmelted his innocence was clear. Ofttimes the accused was forced to walk barefoot over live coals, or to tread on hot plowshares, or to handle a piece of red hot iron. The burns were wrapped up for three days. If, at the end of that time, the burns had healed, the accused party was cleared. Yet another test, that of boiling water, was in vogue. The accused put his bare arm and hand into a kettle of boiling water and lifted an object out. The degree of injury received corresponded to the degree of guilt. Clearly, "to go through fire and water for a friend," was more than a phrase in those days.

Still other ordeals were in use. Two dice, one of these marked with a cross, were placed before holy relics; the accused was required to pick one of them up. If it was marked with the cross he was saved. Or the accused and the accuser were placed face to face under the cross with their arms extended. He who was telling an untruth had no help from a divine source. Fatigue compelled him to drop his arms first. In yet another form of trial by ordeal, practised chiefly by clergy and monks, the holy bread was placed with ceremony in the mouth of the accused. As it was believed that it was fatal to the guilty, an ability even to swallow it was a proof of innocence. One of the latest survivals was the judgment of the bier. This was employed in trial for murder. The corpse was placed on a bier. Domestics, relatives, all who in any way fell under suspicion, or who wished to clear themselves, approached one by one and touched the corpse. The slightest flow of blood from the wound, foam at the mouth, or change of position, was incriminating.

Roman law never recognized trial by ordeal, favoring the torture instead. The papal authority restricted the practice. As early as 1215 the Lateran Council forbade ordeals. These forms of trial were abolished in England in the reign of Henry III

Orders in Council, orders issued by the British sovereign on the advice of the privy council. The council is composed of an indefinite number of gentlemen whom the sovereign may call together in consultation. It may or may not include the members of the cabinet. Unless contrary to law, an order in council is binding upon all British subjects. The authority of the council is less than formerly. The privy council, it may be remembered, ordered the execution of Mary, Queen of Scots. In American history, Orders in Council refer especially to a proclamation of May 16, 1806, forbidding ships to trade on the coast of Europe from the Elbe to Brest in France, and to a second order, made November 11, 1807, forbidding all trade with France. The orders were military measures taken to annoy France, but they interfered with

the rights of American merchants and were among the causes that brought on the War of 1812. The entire government of the czar of Russia was based on a system of orders in council.

Ordinance of 1787. See NORTHWEST TERRITORY.

Ordovician Period, the modern name of that division of the Paleozoic Era of geologic time formerly called the Lower Silurian. It extends from the Cambrian to the Silurian periods. Almost all of the North American continent was under a sea during the Ordovician Period; the marble of Vermont was then only limestone; Iowa, Wisconsin and Illinois lead and zinc were formed then, along with much of our petroleum and natural gas. The sediment that was deposited on the bottom of this sea has been transformed into limestone and sandstone. The sea was inhabited by shell fish and corals, and by what may have been the first animal with a backbone. The life of the Ordovician was not of a high order. Seaweeds and sponges have been found, as also starfish and sea urchins. The brachiopods were represented by many varieties, and trilobites were also found. See GEOLOGY.

Ore, any mineral which contains a metal either free or in combination. If the metal is free, it is said to be native. In a narrower sense only those minerals from which the metals can be extracted with profit are called ores. Within this meaning, many rocks or clays from which the metal cannot readily be obtained, with increased knowledge and improved methods, become ores. See METALLURGY.

Oregon, a state of the American Union. It is situated on the Pacific coast between the states of Washington and California. The Columbia River forms the greater part of the northern boundary. The southern boundary is the parallel of 42° N. The state borders also with Idaho on the east and with Nevada on the south. The general shape is rectangular. The area is 96,699 square miles, fresh water included.

THE PEOPLE. By the fourteenth census of the United States Oregon had a population of 783,389, in this respect ranking thirty-fourth in the Union. This represents an increase of 110,624 over 1910, and in 1910 Oregon held thirty-fifth place. The foreign born element in the state represents about one-seventh of the total; Germans and Canadians are the dominant foreign-born peoples. The 4,589 Indians in Oregon are confined to the Klamath, Umatilla and Warm Springs reservations. The inhabitants are distributed in the proportion of 8.2 to a square mile, and 49.9 per cent of the people dwell in towns and cities. Only four Oregon cities can boast of more than 10,000 inhabitants and only two of more than 15,000; yet the metropolis, Portland, has 258,228. The next city is the capital, Salem, with 17,679; followed by Astoria, 14,027; and Eugene, 10,593.

TOPOGRAPHY. The surface is both level and mountainous. The Coast Range follows along the coast from ten to thirty miles inland. It is about 4,000 feet high and is clothed with dense forests to its very summit. The Cascade Mountains, an extension of the Sierra Nevada, run parallel to the Coast Range about 150 miles inland. The highest peaks are Mount Hood, having an altitude of 11,225 feet; McLaughlin, 11,000 feet; Jefferson, 10,200; and the Three Sisters, 9,420. Some of these peaks are covered with perpetual snow. Forests extend upward to the snow line. A third, shorter range, having the same general direction, occupies the northeastern part of the state. A series of rivers, the Willamette, the Des Chutes, the John Day and the Umatilla drain the northern half of the state into the Columbia. The western slope of the Coast Range is drained by short mountain torrents. The southwest portion, including the region of Klamath Lake, is drained by streams that force their way through the Coast Range to the Pacific. A considerable district in the south central portion is covered chiefly with sage brush. It lies in the great American interior drainage region. The southeastern region is drained into the Snake River, which forms a large part of the eastern boundary. The principal rivers draining the southwest into the Pacific are the Umpqua and the Rogue.

CLIMATE. Owing to the influence of the Japan Current, which here flows south-

ward along the coast, the winters of Oregon are mild. The mean coast temperature for January is about 42°. The summers are cool. July, the hottest month, has a coast temperature of about 62°. Extremes of heat and cold are rare; the central temperature rarely reaches zero. The rainfall in different portions of the state varies greatly, a fall of 85 or 90 inches may be expected on the coast; 50 inches in the Willamette Valley; 13 inches in the northeastern portion of the state, and about 6 inches in the south central or sagebrush region.

MINERALS. The mountains are known to contain silver, zinc, mercury, platinum, lead, antimony, iron, copper, nickel, lignite, coal and cinnabar; but gold is as yet the only mineral product of importance. The state is well supplied with granite, sandstone and limestone building material, and there are pits of excellent clay suitable for brick and tile.

FORESTS. The crest of the Cascade range is the natural eastern boundary of the timber region. West of this line evergreen forests predominate. The trees are chiefly pine, fir, cedar, spruce, tamarack, juniper and yew. Species of alder, maple, ash, oak, willow, birch, poplar, myrtle, manzanita and cherry are also found. The tree most valuable for lumber is the Oregon fir. It is estimated that there are 23,275,000 acres of forests in the state, more standing timber than in any other state. The annual cut varies; at the last industrial census the cut was given as 2,577,403,000 board feet. In that year Oregon ranked third in lumber production, Washington being first and Louisiana second. The general government has established a forest reserve of 4,500,000 acres.

AGRICULTURE. The next industry of importance is agriculture. The principal farming regions are found along the Columbia and its tributaries, and in the valleys between the Cascade and the Coast ranges. In general, the soil is of volcanic origin. It is universally fertile; even the sagebrush region needs only water to make it exceedingly productive. Named in order of bulk, the principal farm crops are wheat, oats, hay, corn, potatoes and barley. The ordinary farm and garden vegetables are raised with ease. Sweet potatoes and watermelons do well, especially in southern Oregon. The soil of the state is well adapted to the production of sugar beets. Hop raising is an important industry. The state, especially the region between the two ranges, is noted for fruit; the production of apples, prunes, pears, peaches, cherries and apricots reaches about 7,000,000 bushels a year. Small fruits yield abundantly. A number of irrigation systems has been started, and the water thus obtained is used chiefly for orchards and alfalfa meadows; an enormous yield of alfalfa may be obtained in this way. Dairying has become an important industry in the cultivated portions of the state. There are extensive cattle ranges east of the Cascades.

Because of the great extent of pasture lands and a temperate climate, Oregon is rapidly forging ahead as a live stock raiser. Numerically the important animal is the sheep; but the figures for recent years show an annual increase in the number of cattle. In 1920 Oregon claimed fourth place in the production of wool, with a clip of 16,039,048 pounds.

MANUFACTURE. Valuable waterpower for manufacture is developed at The Dalles, Cascades and Oregon City. The canning of Columbia salmon is an important industry. Lumber and lumber products are manufactured at numerous points. Car building, woolen manufactures, meat packing, canning and drying of fruit, and publishing, give employment to many persons. There are in all sixteen shipbuilding plants. The wheat of the state is milled chiefly at home and exported in the form of flour. In 1920 Oregon had 2,707 manufacturing establishments; in that year the lumber mills numbered 507, probably more plants than any other Oregon industry has.

TRANSPORTATION. The inland waterways of Oregon have been extensively improved by dredging and canalizing; a long coast line indented with numerous harbors insures ample deep seat transportation facilities; and the railroads of the state are undergoing continual extension. Portland, about 100 miles inland from the Pacific, is

WASHINGTON AND OREGON

1. Commerce
2. Hops
3. Wheat
4. State Flowers
5. Products
6. Grazing
7. Apples
8. Oats
9. Forests

at the head of deep sea navigation; light craft, going through the locks at the Cascades and the Celilo Canal around the Dalles of the Columbia, ascend as far as Lewiston, Idaho. From Portland to Eugene the Willamette River is navigable, 150 miles. The total navigable waterways have a length of about 2,250 miles.

Oregon had 3,626 miles of railroads in 1920, an increase of 1,213 miles over 1910. West of the Cascades runs the Southern Pacific line. West of Portland along the Columbia runs the Union Pacific; east of Portland along the river extends the Spokane, Portland & Seattle Railroad. Other sections of the state will soon have ample rail transportation facilitties. The finest motor road in the state is the now famous Columbia River Highway (which see).

INSTITUTIONS. Oregon's charitable and correctional institutions are numerous and adequate, all are under a board of control consisting of the governor, secretary of state and state treasurer. These institutions include the State Institution for the Feeble-Minded, Oregon State Tuberculosis Hospital, State School for the Deaf, Oregon State Training School, Oregon State Industrial School for Girls, Oregon State School for the Blind, Oregon State Hospital, located at Salem. At Pendleton is the Eastern Oregon State Hospital and at Roseburg the Oregon State Soldiers' Home. The state prison is also at Salem.

EDUCATION. Primary education is free, and is compulsory for the full school term for all between the ages of 9 and 15. In 1921 Oregon had 2,527 primary public schools and 235 standard four year high schools. The normal school had 42 instructors and was attended by 1,350 students. Among the institutions of higher learning are Methodist, Baptist, Presbyterian and Catholic colleges, Pacific College, Reed Institute, a very well equipped State Agricultural College at Corvallis, and the University of Oregon at Eugene.

The latter institution, founded in 1872, is the last unit in Oregon's system of public instruction. The university was opened in 1876 and now comprises colleges of literature, science, arts, law, journalism, education, commerce, medicine, music and architecture and a graduate school. The law and medical schools are at Portland. The student body of the university numbered 3,122 in 1922, and the faculty 153.

GOVERNMENT. Oregon is one of the most progressive states in the Union in the matter of legislation. The constitution was adopted upon admission in 1859, and was amended in 1902. Under this amendment Oregon adopted the initiative and referendum. Full suffrage was extended to women in 1912.

The legislature consists of a senate of 30 members elected for four years and a house of representatives of 60 members elected for two years.

Executive power is held by the governor, secretary of state and state treasurer, each of whom is elected for a four year term. Under the state law the governor may serve but two terms in twelve years, and the two other executives are declared ineligible for immediate reelection.

The judicial system includes a supreme court of one chief justice and six associate justices, circuit courts, county courts, probate courts and courts of justices of the peace.

HISTORY. Oregon is a portion of the original Oregon (now Oregon, Washington and Idaho), a region claimed by the United States by virtue of the discovery of the Columbia River in 1791 by the Lewis and Clark expedition of 1805-6. In 1811, a trading station was established in Astoria, near the mouth of the Columbia, by the American Fur Company of which John Jacob Astor was the leading spirit. Immigrants began to enter the state in the thirties. In 1834, Rev. Jason Lee, who had come overland to Oregon, established a Methodist mission in the Willamette Valley. In 1836, Dr. Marcus Whittman, the leader of a colony of Presbyterians, founded a mission at Walla Walla. The territory of Oregon was organized in 1853. Oregon was admitted to the Union in 1859. The capital is Salem, on the Willamette. Oregon has had its share of difficulty with the Indians, especially with the Shoshone and the Modoc.

STATISTICS. The following statistics are the latest from trustworthy sources:

Land area, square miles	95,607
Water area, square miles	1,092
Forest area, acres	23,275,000
Irrigated area, acres	986,000
Population (1920)	783,389
White	769,146
Negro	2,144
Indian	4,589
Asiatic	7,510
Foreign born	102,151
Chief cities	
Portland	258,228
Salem	17,679
Astoria	14,027
Eugene	10,593
Number of counties	36
Members of state senate	30
Members of house of representatives	60
Salary of governor	$5,000
Representatives in Congress	5
Assessed valuation of property	$1,040,839,049
Bonded indebtedness	$28,090,000
Farm area, acres	13,542,318
Improved land, acres	4,913,851
Wheat, bushels	24,317,000
Oats, bushels	8,704,000
Potatoes, bushels	3,870,000
Barley, bushels	2,240,000
Corn, bushels	1,980,000
Hay, bushels	2,544,000
Hops, pounds	9,240,000
Sugar beets	
Fruit, value	$15,787,803
Wool, pounds	16,039,048
Domestic Animals:	
Horses	276,000
Milk cows	216,000
Other cattle	675,000
Sheep	2,270,000
Swine	272,000
Manufacturing establishments	2,707
Capital invested	$237,254,736
Operatives	58,559
Raw material used	$206,206,041
Output of manufactures	$366,782,627
Lumber, feet	2,577,403,000
Salmon, cases packed	481,545
Silver, ounces	43,120
Gold, ounces	37,500
Coal, tons	13,328
Miles of railway	3,626
Teachers in public schools	8,079
Pupils enrolled	190,159

Orestes, ō-rĕs′tēz, in Greek mythology, the son of Agamemnon and Clytemnestra, king and queen of Mycenae. When Agamemnon returned from the Trojan War, Clytemnestra and Aegisthus laid a plan to murder him and his son. They were successful so far as Agamemnon was concerned, but Orestes was saved by his sister Electra, who had him carried secretly to his uncle Strophius. When grown to manhood, Orestes returned to Mycenae and avenged his father's death by slaying both Aegisthus and Clytemnestra. Orestes, though he had been advised by an oracle to take his mother's life, was, in consequence of the deed, driven frantic by the Furies and pursued from land to land. At length he was directed by an oracle to bring from Tauris in Scythia a statue of Artemis, said to have fallen from heaven. Accompanied by Pylades, his cousin, who had been his faithful companion, he went to Tauris. The people of this place were in the habit of sacrificing strangers, who fell in their way, to the goddess. Orestes and Pylades were seized, bound, and borne to the temple. But the priestess of the temple was Iphigenia, Orestes' sister, who had years before been snatched from death on the altar by Artemis. Iphigenia saved the prisoners from death and all three returned to Mycenae. Orestes was at last purified of his sin by Minerva and relieved from the persecution of the Furies. Both Sophocles and Euripides have used this story for the subject of tragedies.

Organ, the noblest of musical instruments. In some form the organ was known in the remotest antiquity. It is a development of the ordinary whistle. In place of a single whistle blown by the breath, the organ consists essentially of three parts,—pipes, a reservoir of compressed air, known as wind, and, lastly, the action, a mechanical arrangement, including the keyboard and pedals, by which the air is admitted to the tubes. The note given forth by a pipe depends on its length. Doubling the length of a tube produces a note an octave lower. Thus pipes two feet, four feet, eight feet, and sixteen feet in length produce notes successively an octave apart. A series of pipes comprising an octave is a stop.

The quality of the note is determined by the size and material of the pipe. The pipes of any one set or stop are supposed to be alike as to quality. Metal pipes, wooden pipes, broad pipes, and narrow pipes give notes differing in quality. There is a difference also between a note produced by a current of wind playing across the open end of the pipe and that produced by a metallic tongue set in vibration.

Up to the sixteenth century, the organ was used as an accompaniment for the human voice. The organs of the medieval cathedrals were used as accompaniments for chants. Organ music then began to take on a new character. Many composers, especially Sebastian Bach, have written music for the organ alone. Though used in concert halls and opera houses, the organ is still preëminently the instrument of church service. One of the chief charms of an old cathedral is the organ. Organ screens—curtains of wood or stone—are traditionally the richest specimens of the sculptor's art. The organ of St. Peter's, Rome, has 100 stops. The organ in Seville Cathedral has 5,300 pipes. The largest organ ever built is in the town hall of Sydney. It has 8,000 pipes,—the largest, a contra-trombone, is sixty-four feet long; the smallest is a fraction of an inch in diameter. This organ occupies a space eighty-five feet long by twenty-six feet wide. The largest in London is in Albert Hall. For a long time the organ in the Tabernacle at Salt Lake City was the largest in America, but in 1915 an organ was constructed on the exposition grounds at San Diego, California, which exceeded in size any other organ in the world. The organ, in essentially its present form, is said to have been perfected at Alexandria about 200 A. D. but many additions have been made. Charlemagne had an organ in his cathedral at Aix-la-Chapelle.

Origen, ŏr′ĭ-jĕn, (185-254), one of the early Greek fathers. He was born at Alexandria, and was instructed by his father in the Christian religion. Later he studied under Clement of Alexandria, and under Ammonius. When he was seventeen years of age his father suffered martyrdom, after which the young man supported his mother and sister by teaching. The following year he was appointed to instruct the believers in Alexandria, and his lectures were attended by crowds of both men and women. Throughout the remainder of his life he suffered frequent and unjust persecution. At one time a popular tumult compelled him to flee to Palestine. There he preached in the bishop's assemblies and was ordained presbyter, but Demetrius, Bishop of Alexandria, declared that he, only, had the right to ordain Origen, and from that time until Demetrius' death Origen suffered, being banished when he returned to Alexandria, and excommunicated. Origen established himself in Caesarea and soon had a flourishing school, the reputation of which was connected always with his indefatigable zeal for religious studies and for imparting instruction. In the year 250 the persecution which bears the name of the emperor, Decius, broke out. Origen was arrested, imprisoned and tortured. Although liberated again he never recovered from these sufferings and died a few years later.

Orillia, Ontario, an industrial town, is situated at the head of Lake Couchiching and on the Grand Trunk, Canadian Northern and Canadian Pacific railroads, 86 miles north of Toronto. Because of its location in a region noted for its scenic beauty, Orillia was originally only a summer resort; but it is now of considerable industrial importance. There are manufactories of saw mill machinery, lumber, wood specialities, clothing, woolen goods, shoes and canoes, and there are two smelters and several foundries. Abundant water power and timber are aids to manufacture. Orillia has five public schools and a collegiate institute, a library, a Y. M. C. A., a theater, a Provincial Asylum for the Feeble-Minded, and three parks. Population, 1921, 8,744.

Orinoco, the most northerly of the three great rivers of South America. It rises in northern Brazil and flows northward, then eastward through Venezuela into the Atlantic. Its mouth lies outward, that is, eastward of the Caribbean Sea. In seasons of high water, boats are able to pass from the headwaters of the Amazon into those of the Orinoco by various channels. The river is navigable for a distance of about 900 miles to a point where it is interrupted by rapids. The Orinoco is a mighty stream. Five hundred miles from the ocean it is four miles in width. Its basin is occupied by forests exceeding even those of the Amazon in gloomy magnificence. Trees of enormous size, creeping vines, aromatic odors, bright plumaged birds are beyond descrip-

tion. Hordes of monkeys chatter in the trees. Enormous serpents lie in wait for deer and peccaries. The waters are full of fish and alligators. Beyond the range of forests the basin is occupied by extensive grassy plains. The Orinoco is about 1,500 miles in length. Its basin has an area of 368,000 square miles. See CASSIQUIARI; AMAZON; VENEZUELA.

Oriole, ō′rĭ-ōl, a bird giving its name to a large family, including the bobolink, meadow lark, and blackbird. The orioles feed chiefly on insects, as caterpillars and beetles. The orchard oriole with black head, neck, breast, and back, and chestnut under parts, and his olive colored mate are familiar birds in the orchards and lawns of eastern North America. A deep pocket-shaped nest of woven threads and grasses is hung from the tip of a limb twice a person's height from the ground. It receives from three to five bluish white eggs with dark spots. Chapman says, "There is an air of refinement about this bird which seems to pervade his whole life history. He dresses quietly but with excellent taste, his nest is of the choicest materials. Words cannot describe his song, but no lover of bird music will be long in the vicinity of a singing orchard oriole without learning the distinguished songster's name." The Baltimore oriole occupies the same range, going likewise to Central America for the winter, but it is a shyer bird and swings its nest from higher twigs, up to sixty feet in the cottonwoods of the West. This is the species of which Whittier writes,

> Alone the hang bird overhead,
> His hair-swung cradle straining.

The male is clad in shining black and deep, rich orange,—the colors of Lord Baltimore, whence the name. The female wears the same colors but duller and less striking in effect. The oriole is a favorite bird with American writers. Mrs. Olive Thorne Miller has written entertainingly of orioles and their young.

> And look! that flash of flamy wings,
> The fire-plumed oriole,

says Holmes, and we may add this word from Bradford Torrey: "Whist! there goes an oriole, a gorgeous creature, flashing from one elm to another and piping in his happiest manner as he flies."

Orion, ō-rī′ŏn, in mythology, the son of Neptune. He was of great stature and followed the hunt. His adventures were numerous. The most important, however, as well as the last, was that with Diana with whom he engaged in the chase. Despite her vows of perpetual virginity, Apollo became alarmed lest his sister should marry her gigantic companion. Observing him one day wading in the sea with his head just visible, Apollo chaffed Diana, wagering that she could not hit that black object yonder on the water. In ignorance of what she was doing the archer goddess took fatal aim and killed him. When the waves rolled her dead lover to her feet she was distracted with grief and placed him in the heavens, where he still pursues the Pleiades and is followed by his faithful dog, Sirius.

The constellation of Orion is the most brilliant in the heavens. Four of the brightest stars form a quadrangle; three others, near the center, are known as Orion's Belt. See PLEIADES; DIANA.

> Many a night from yonder ivied casement, ere I went to rest,
> Did I look on great Orion sloping slowly to the West. —Tennyson, *Locksley Hall.*

Orkney Islands, an archipelago of northern Scotland. Twenty-eight of the islands are inhabited. Some of the smaller contain but a family or two. The highest elevation in the group is 1,600 feet. The total area is about 390 square miles. One hundred and seven thousand acres are under cultivation. Oats, hay, and turnips are the principal field crops. The summers are cool; the winters are stormy. Sheep, cattle, and horses were formerly of a stunted breed; but improved strains have been introduced of late. The women knit, and raise rabbits and poultry. The men build boats, make sails, nets, and ropes, and catch herring and codfish. Steamers from Aberdeen and Leith call regularly. The principal town is Kirkwall. The Orkneys are mentioned by Ptolemy, Pliny, and other Roman writers. There are numerous remains of the ancient Picts. In 1099 the Scandinavians took possession of the islands. The present inhabitants are reported at 28,698. They show strong traces of Scandinavian blood. Scandinavian words are incorporated in the language of the peo-

ple. Orkney is a Gaelic word, meaning "Islands of Whales."

Orleans, a city of France. It is situated on the bank of the Loire River. The name is derived from that of Aurelian. The town was known during the period of Roman occupancy as Aurelian's City. It is noted for manufactures of blankets, hosiery, woolen goods, and vinegar. There are exports of wine, grain, and timber. The city was a center of the Huguenots. A magnificent Gothic cathedral destroyed by them was afterward rebuilt by Henry IV. The interior is 485 feet long. The nave is 100 feet high. Orleans is a city of historical importance. It withstood a siege by Attila. The French under Joan of Arc relieved it from a besieging force of the English in 1429, gaining for her the name of the "Maid of Orleans." In 1870 Orleans was taken by the Germans after severe fighting. The present population is about 67,000. A younger branch of the Bourbon family was known as the House of Orleans. The city has given its name to the Isle of Orleans in the St. Lawrence River, and to the American city of New Orleans at the mouth of the Mississippi.

Ormulum, ôr'mū-lum, a series of homilies, in verse, on the New Testament. Orm, an Augustinian canon of England, composed this work in the early part of the thirteenth century, and gave it his own name:

> This boc iss nemmned Orrmulum
> Forrthi that Orm itt wrohhte.

Ormuzd. See MYTHOLOGY, PERSIAN; ZOROASTER.

Ornithology. See BIRD.

Oronhyatekha (1841-1907), a Canadian physician, was one of the few full-blooded Indians in North America who rose to prominence in the professions. He was born near Brantford, Ontario, and studied at a Canadian industrial school, at Kenyon College, Gambier, Ohio, and at the University of Toronto. An address delivered by the young Indian to the Prince of Wales (later Edward VII), won him the prince's invitation to study at Oxford. He availed himself of the opportunity, and then returned to Canada and practiced medicine at Frankford, Ontario, later moving to Toronto, where he was highly successful. He was elected Supreme Chief Ranger of the Indian Order of Foresters in 1881.

Orpheus, ôr'fē-üs, in Greek mythology, a harper of wondrous skill. Then men, for interruption of their hunting, sent his wife to the lower world; whereupon the harper filled the woods with his sorrowings till even the rivers stayed in their courses. Harp in hand, and playing his sweetest tunes, Orpheus prevailed upon the three-headed Cerberus, the dog that kept the entrance to hell, and Charon, the horrid old gatekeeper, and even those fierce goddesses, the Fates, to admit him to the presence of the king of the lower world before whom he played his divinest strains for the release of his beloved wife. The wheel of Ixion stood still, Tantalus ceased to strive for water, the insatiable vulture tore not the liver of the king, and all the punishments of hell were suspended for his harping. The king told Orpheus to lead on, his wife should follow; but not to look backward once, lest he lose her again. The harper set forth playing away bravely, but on passing the outermost portal into the light, he could not resist the temptation to throw a glance over his shoulder to see whether the dear wife were really following him. This was the forbidden act.

Orrery, an astronomical contrivance. The name was given by Richard Steele to one constructed for the Earl of Orrery from plans drawn by a George Graham, who invented it. It is known also as a planetarium. The principal planets and the moon were represented by spheres affixed to wires. The wires are inserted in disks of metal which may be caused to revolve by cogwork so as to represent the motions of the planets and moon about the sun. The spheres used are necessarily so out of proportion to the actual relative sizes of the heavenly bodies that the orrery is to be regarded as an astronomical toy, rather than a valuable means of geographical instruction. See PLANETS.

Ortolan, a garden bunting of the Old World. It is a small bird of sparrow size, nesting in bushes and on the ground as far north as Lapland, but going south for the winter. Large numbers are taken in the Mediterranean region for the table. In the island of Cyprus, especially, they are caught

in a net, and sometimes they are fattened until they are as plump as an egg. At last reports large numbers were seasoned with spices, pickled in vinegar, and packed, 300 to 400 in a cask, for export. Cyprus is credited with exporting several hundred casks of ortolans a year. The ancient Roman epicures considered roasted ortolans a table dainty.

Osage Orange, a small thorny tree or shrub of the nettle family, closely allied to the mulberry. The name comes from its native locality and large, orange-like, worthless fruit. It is native to North America, from Kansas to Texas, and has been introduced eastward as far as Massachusetts as a hedge plant. The objections to osage hedges are want of hardiness in the North, and the width of ground impoverished by their extensive roots. In these particular respects wire fences are preferred. The sap contains milky rubber. The wood is fine grained, tough, and elastic. It was much used by the plains Indians for bows. The French trappers called it *bois d'arc,* or bowwood. Many a buffalo fell before arrows driven by osage orange bows.

Osaka, ō′zä-kä, the second city of Japan. It is one of three imperial cities, or cities honored by the emperor as a place of residence. It is situated at the mouth of the Yodo on the Island of Hondo. It occupies both sides of the river and an island. Numerous connecting bridges and canals convey an impression of Venice. A commodious harbor is protected by an artificial mole. It is occupied by a forest of masts and smokestacks. The city carries on an extensive commerce with China, Korea, and Japanese ports. There are extensive manufactures of tobacco, clocks, ironware, boots and shoes, matches, glass, tools, chemicals, paper fans, and pottery. Among the antiquities of the city is a royal castle of massive stonework built in the sixteenth century. In 1909 a great fire destroyed 20,000 buildings, including the city's Buddhist temple, the largest in the world, the stock exchange, banks, government buildings, and factories. The losses ran into millions of dollars and thousands of persons were made homeless. An area over four miles square was burned over. The population, as given in the year 1920, is 1,253,000.

Osceola (1804-1838), a Seminole chief. His Indian name, of which Osceola is a corruption, was Asseheholar, meaning, in the Seminole tongue, black drink. Osceola was born on the banks of the Chattahoochee River in Georgia. His father was William Powell, a trader. His mother was an Indian princess. He was taken to Florida with her people when he was four years old, where he grew up to hate the whites. When the Seminoles were asked to cede their Florida possessions, Osceola used his utmost influence to prevent the cession. In 1835 his wife, the daughter of a runaway negro, was seized and carried into slavery. This incensed the hostility of Osceola all the more. He threatened the Indian agent, General Thompson, so violently that he was put in irons and thrown into prison for six days. The wily chieftain feigned to have overcome his resentment, but he was no sooner released than he repaired to his people and returned with a band of warriors December 28, 1835. He fell upon the agency and put Thompson and four others to death. This was open warfare. Osceola and his band fell upon Major Dade and his command of 110 men; but, losing a second fight against a more successful American commander, Osceola and his followers took refuge in the everglades from which they sallied out now and again, carrying on a partisan warfare. After two years of this guerrilla warfare Osceola was led to confer with General Jesup under a flag of truce. The white man, in violation of his pledge, seized Osceola and conveyed him to St. Augustine. Later he was imprisoned at Fort Moultrie in the Charleston Harbor, where he died. In view of the fact that Osceola was abandoned by a white father; that his people were driven from his native country into Florida; that the whites followed them there and seized their country; that his wife was stolen from him and enslaved, Osceola's lifelong opposition to the whites does not seem unnatural. His grave in a grove near Fort Moultrie bears this motto:

OSCEOLA, PATRIOT AND WARRIOR
Died at Fort Moultrie
January 30, 1838

Oshawa, Ontario, is two miles from Lake Ontario and 34 miles east of Toronto, on the Canadian Northern, Canadian Pa-

cific and Grand Trunk railroads. An electric railway connects the factories of Oshawa with the steam roads and also provides passenger transportation. The numerous industrial plants issue pianos, hardware, automobiles, gas and steam fittings, leather, woolens, textiles, metal specialities and malleable iron. This thriving city is well laid out and has three parks, an armory, a Y. M. C. A. and a large hospital. The educational system comprises five primary public schools, a high school and a library. In 1921 the population was 11,940.

Oshkosh, Wis., an industrial city and the county seat of Winnebago County, is situated on the western shore of beautiful Lake Winnebago—at the mouth of the Fox River, 81 miles northwest of Milwaukee. It is served by the Chicago & Northwestern, Minneapolis, St. Paul & Sault Sainte Marie and Chicago, Milwaukee & St. Paul railroads, by lake steamers and by interurban electric lines.

The district for which Oshkosh is the commercial center was once heavily forested, and lumber products are still the principal commodities produced by the city's factories; these products include sash and doors, furniture, matches, wagons and building timbers. Other Oshkosh products are machinery, matting, grass twine, flour and tobacco.

Oshkosh has good elementary and high schools, a normal school and a public library. Notable buildings are the city hall, St. Mary's Hospital, court house and Federal building. Near the city is a large hospital for the incurably insane. There are two beautiful parks in the city, and Lake Winnebago is a justly popular summer resort. In 1920 the population was 33,162.

Osier, a popular name of several willows used in basketry. The shoots must be long, pliant, and tough. See WILLOW.

Osiris, ō-sī′rĭs, in Egyptian mythology, the Lord of Lords, or King of the Gods. He seems to have represented the sum of all good, as Set represented the sum of all evil. Osiris is said to have been the son of Isis. In other and perhaps more numerous accounts he is represented as the brother and husband of Isis. According to the legend Osiris and Isis assumed human form and descended to earth that they might aid and instruct mankind. Osiris was regarded also as the judge of the dead. See MYTHOLOGY, EGYPTIAN; SET; APIS.

Osler, William (1849-1919), a Canadian-American scholar and physician. He was born at Toronto, his education being obtained in Toronto and McGill Universities and in London, Berlin and Vienna. He has been lecturer in or professor of medicine at McGill University, 1874-84; at the University of Pennsylvania, 1884-9; at Johns Hopkins, 1889-1905; and, since 1905, regius professor at Oxford. Dr. Osler has written a number of books on medical subjects, as well as several collections of essays. He is an inspiring teacher and a profound scholar. Some years ago he gained great newspaper notoriety by a speech in which he made some remarks in a humorous vein to the effect that men were useless after reaching sixty years of age, and ought to be chloroformed. To believe that Dr. Osler was serious in any such doctrine is absurd.

Ossian, Poems of. See MACPHERSON.

Ossoli, ŏs′sō-lē, **Marchioness, Sarah Margaret Fuller** (1810-1850), an American writer. She was born at Cambridgeport, Massachusetts. Possessed of a brilliant intellect and an ardent temperament, Margaret Fuller, as she is called usually, is remarkable for her association with literary men and her influence upon literary and artistic taste, rather than for her own productions. In 1840-42 she was editor of the *Dial.* In 1844 she became literary critic of the *New York Tribune.* A few years later she visited Europe and married the Marquis d'Ossoli. She served in the Italian hospitals during the siege of 1849. She embarked with her husband and child for America, but suffered death by shipwreck almost in sight of port. Margaret Fuller was a friend and literary associate of Emerson. She belonged to the transcendental school of philosophers. Her books are collections of essays published originally in various periodicals. Among the titles are: *Summer on the Lakes, Woman in the Nineteenth Century,* and *Papers on Literature and Art.*

Osteopathy, a school of medical practice. It was founded in 1875 by Dr. An-

drew Taylor Still, a physician of the allopath or "old school" of medicine. The first school of instruction was established at Kirksville, Missouri, in 1895. Other institutions have been established at Minneapolis, Des Moines, Boston, Philadelphia, and elsewhere. There are now between 3,000 and 4,000 practitioners. The first success of Dr. Still came in the management of dislocated bones. The osteopaths teach that the use of drugs, whether in large or homeopathic doses, is contrary to nature and may be permitted only as a last resort. Rubbing, foments, poultices, baths, and all the customary non-chemical aids are permissible when required. Even the surgeon's knife may be necessary; but the secret of osteopathy is manipulation of the mechanism of the body. The movement of an organ generates heat; heat, chemical action and electricity. The latter and nerve action are interchangeable. Put in a practical way, the osteopath seeks first to locate the injury or affection. He then proceeds to stimulate or soothe, as may be needed, the center from which the nerves lead to the seat of the trouble. A congested lung, for instance, is relieved by stimulating the nerves found by the expert at a particular spot near the backbone. By skillful manipulation he influences the nerves to call into extra activity the organism charged with removing and carrying away the obstructive matter, that which clogs the lung. A headache and many other ailments are reached in the same way, only through a different set of nerves. The osteopath makes no claim to a magnetic touch, but merely to a scientific knowledge of anatomy and disease.

Ostracism, a political institution of Athens. It was designed to protect the state against individuals who might seem to be acquiring too much influence, or who might be suspected of harboring designs for their own aggrandizement. It was directed particularly against leaders in civil strife. The measure is credited to the fertile brain of Cleisthenes. Yearly the ten tribes were given an opportunity to point out any man whom they deemed dangerous to the quiet of the city. A place in the agora was inclosed by barriers. Ten gates admitted the members of the ten tribes. The voters were handed ostraka, or bits of pottery on which to write the name of one whom the voter might wish to ostracise. The archon counted the ostraka. In case a name appeared on a majority of the tablets, provided this adverse vote was not less than 6,000, the ostracised obnoxious citizen was given ten days to leave the city. The period of exile was ten years. There was nothing dishonorable about ostracism. It did not involve forfeiture of goods or bonds, nor was it a banishment into barbarism; for there were many Greek cities of no little splendor with which Athens kept up close commercial relations. Among famous men ostracized were Themistocles, who built the long walls and established the Athenian naval power; Aristides, "the Just," and Cimon, the son of Miltiades. A similar custom called petalism prevailed at ancient Syracuse. It was modeled on the ostracism of Athens, from which it differed chiefly in that the voter wrote on an olive leaf and the period of banishment was five years. The law of petalism was repressed 452 B. C. on the ground that it deterred worthy citizens from taking an active part in public affairs. The chances are, however, that some demagogue feared he might be shut out if the practice were continued. The law of ostracism is known to have been in force at other Greek cities, certainly at Argos and Megara, but details are wanting. See BALLOT.

Ostrich, the largest, strongest, and fleetest of living birds. It belongs to a flightless family, including the rhea, cassowary, emu, and apteryx. It was once abundant on the dry but not desert plains of southwestern Asia and Africa. The wild bird is now confined to small regions of southern and eastern Africa. The male ostrich reaches a height of eight feet and an extreme weight of 300 pounds. The ostrich has a sharp eye, and is quite able to distinguish friend from foe at a distance of six miles. It is a swift, powerful runner, easily outdistancing a horse. One authority claims that the ostrich is capable of making twenty-seven miles an hour. The legs move so rapidly that the eye confuses them like the whirling spokes of a carriage wheel. The wings are of assistance in running, but the ostrich cannot fly. The foot consists of two enormous toes. A single blow of

Ostrich.

South American Rhea.

THE OSTRICH.

the foot is sufficient to break a man's shoulder or to disembowel a horse.

Ostriches were formerly numerous in Syria, Palestine, and northern Africa. Until of late, flocks of 200 or 300 birds were to be seen in south Africa, grazing among giraffes, zebras, antelopes, and gnus, but now they are seldom seen outside of domestication.

Accounts of the habits of the ostrich differ. From Lichtenstein's *Travels in South Africa* we learn that during the breeding season wild ostriches live in companies of from three to five, consisting of one cock and several hens. The females deposit their eggs in a common nest, which is a mere hole scooped out of the sand. During the day the female birds take turns in guarding the nest, but seem to leave the eggs for the most part to the warmth of the sun. At night the male bird covers the eggs, with the hens grouped about him. The eggs of the ostrich are twenty inches in circumference. It requires six weeks to hatch the eggs. The newly hatched ostrich chicks are as large as a full grown barnyard hen.

One traveler tells of a pair of ostriches surprised with a dozen young the size of guinea fowls. The female started off with drooping wing, feigning lameness, and actually pitched forward to the ground; while the male went off in another direction with the little ones. The statement has been made on somewhat doubtful authority that the ostrich breaks addled eggs about the nest in order to attract large numbers of flies as food for the young. The ordinary food of the ostrich is grass, leaves, grain, and seeds. In captivity it does well on a diet of clover or alfalfa.

The Arabs now raise ostriches in the oases of the Sahara, where they feed as tamely as sheep. Ostrich farming began in Cape Colony about 1867. In 1920 the assessor reported 225,000 ostriches producing $5,000,000 worth of feathers a year. In domestication, a dry pasture of ten to twenty acres per bird is found necessary. The farmers raise ostriches for the sake of the feathers. Those of the wing and tail are in great demand for trimming hats. Feather "plucking" begins when the bird is eight months old. After that there are three pluckings a year. As a matter of fact the large feathers are cut off. Each bird is expected to yield about one and one-half pounds of feathers, worth from fifteen to fifty dollars. The milliner expects to charge from three to fifty dollars for a fine ostrich plume. The body feathers of the male are black and glossy; the wing feathers are white with occasional streaks of black; the tail feathers white, sometimes toning into ivory. The body feathers of the female are dark gray, the wing and tail feathers white, with gray or ecru markings.

The exportation of ostriches from South Africa has been prohibited, practically, by an export tax of £100, that is to say, $487 each. Eggs may not be sent out of the country at all. It is intended to reserve for that region as far as possible a monopoly of ostrich raising; otherwise ostriches may be purchased by local farmers at about $122 each. Birds of pedigree may bring as high as $500 or even $1,000.

Ostriches have been domesticated to the number of 500 at Pasadena and Los Angeles, California. There is an ostrich farm at Jacksonville, Florida; one at Hot Springs, Arkansas; one in Texas. There are about 3,000 birds in the Salt River Valley near Phoenix, Arizona. A full grown ostrich is worth about $250. Visitors do well to keep out of reach of bill and foot, for the male ostrich has a vicious pleasure in using both. An oft mentioned habit of swallowing stones, bits of iron, and the like, is not at all different from that of barnyard fowls, only that the pieces are larger.

The bones of an extinct ostrich, the dinornis, have been found in New Zealand. Its height must have been at least twelve feet, twice that of a man. The rhea of South America is a related bird. It inhabits the grassy plains of Argentina and Paraguay.

See Emu; Cassowary; Apteryx.

Ostwald, William (1853-), a German chemist. He was born in Riga, was educated at Dorpat, and became a lecturer there in 1878. In 1882 he was appointed professor of chemistry in Leipsic from 1887 to 1906. He visited the United States in 1905-6 and lectured at Harvard as exchange professor between the American and German universities. As an investigator in physical chemistry and chemi-

Cassowary.

Emu.

OTHER RUNNING BIRDS.

cal affinity, his researches on the color of ions, the electric conductivity of organic acids, and the parallel existing between the volume of these acids and their power of chemical reactions, have attracted wide attention. He has written a number of authoritative works on chemistry.

Oswego, N. Y., a port of entry and the county seat of Oswego County, is on the south shore of Lake Ontario and on the New York State Barge Canal, 35 miles northwest of Syracuse. The New York Central, Delaware, Lackawanna & Western and New York, Ontario & Western steam railroads and the Empire State Electric Railway serve the city.

Built on level ground above the lake and bisected by the Oswego River, the city is very attractive. It has broad, paved streets and along the river edge and lake shore are handsome drives. There is an outer and an inner harbor.

Oswego is very important commercially, and no expense has been spared for wharves and rigging to handle the great quantities of coal, grain and lumber that pass through the port. The city is the home of the largest match factory in the world and has many other factories, producing boilers, engines, pumps, ice making machinery, small tools, paper and wooden boxes, candy, knit goods, gloves, felt footwear, yarns and office specialities. Notable among the city's buildings are the state normal school, high school, Gerritt Smith Library, state armory, a Federal building and a United States Coast Guard station. Oswego has eleven city parks and one state park, the latter containing twenty-two acres.

Originally, Oswego was a British military post, the first fort having been built in 1726; just prior to the French and Indian Wars, two other forts were erected. These forts were captured and razed by Montcalm in 1756. The British regained possession in 1758, holding the post until 1796. Again in 1812 the British captured Oswego and destroyed the fortifications and almost all the harbor equipment. The city is now the site of a modern infantry post, but the remains of the old fortifications are still to be seen. In 1920 the population was 23,626.

Othello, The Moor of Venice, a tragedy by William Shakespeare, written about 1604, and published first in 1622. The plot is based on a story told by an Italian novelist. It is the simplest of the four great tragedies, of which the other three are *Hamlet, Macbeth,* and *King Lear.* Othello, the Moor, wins the love of Desdemona, daughter of Brabantio, and weds her against her father's wishes. Then Iago, the ancient of Othello, suggests to his master that Desdemona is unfaithful. Othello, as he believes, finds proof that this is true and murders his wife by smothering her in her bed. Then, learning that she is innocent, he stabs himself. The character of Othello is the center of interest in this play. While less interesting as a reading play than the other tragedies mentioned above, Othello has been more popular on the stage. Othello was one of Salvini's greatest roles, which he played at one time with Edwin Booth as Iago.

> Othello, with his barbaric innocence and regal magnificence of soul, must cease to live the moment he ceases to retain faith in the purity and goodness which were to him the highest and most real things upon earth. Or if he live, life must become to him a cruel agony. Shakespeare compels us to acknowledge that self-slaughter is a rapturous energy—that such prolonged agony is joy in comparison with the earthy life-in-death of such a soul as that of Iago. . . . To die as Othello dies is indeed grievous. But to live as Iago lives, devouring the dust and stinging—this is more appalling. . . . Othello dies "upon a kiss." He perceives his own calamitous error, and he recognizes Desdemona pure and loyal as she was. Goodness is justified of her child. It is evil which suffers defeat. It is Iago whose whole existence has been most blind, purposeless and miserable—a struggle against the virtuous powers of the world, by which at last he stands convicted and condemned.—Dowden.

Otho, or **Otto I** (912-973), one of the great rulers of Germany. His father was Henry I. He was crowned king of Germany at Aix-la-Chapelle in 936. When he came to the throne Germany was a country lying along the Rhine. It was Otho who developed the policy of extending Germany eastward to include its present territory. He added Bavaria, Bohemia, northeastern Prussia, and other territory to his dominions. He repelled the Bulgarians, driving them permanently into the valley of the Danube where they still dwell. He

instituted many reforms within his dominions. He reduced the powerful dukes to at least nominal obedience to the crown. Taking advantage of the troubles of Italian rulers, he crossed the Alps with an army, and in time brought about his own coronation as king of Italy. Still later, in 962, through the influence of the Catholic clergy to whom he had ever been a fast friend, he was crowned emperor by the pope at Rome. This combination of Germany and Italy is known in history as The Holy Roman Empire of the German People. It was a revival of the empire of Charlemagne,—a recognition of the notion prevailing at the time that the world should have two heads, one spiritual, one temporal, that all Christians, through their churches, should be united under the spiritual leadership of the pope, and that all peoples, through their rulers, should be united under the temporal leadership of an emperor. Theoretically, any Christian might aspire to become pope, and any Christian might hope to be elected emperor. As a matter of fact, the imperial office became for centuries a perquisite of the German kings.

Otis, James (1725-1783), an American statesman. He was born at West Barnstable, Massachusetts. He was graduated from Harvard in 1743. He opened an office for the practice of law in Boston in 1748. He was considered the leading lawyer of Boston. In 1761 he appeared in court for the colony in opposition to an application made before the supreme court for writs of assistance to search for smuggled goods. His speech occupied three hours. It is spoken of as "The first scene of the first act of opposition to the arbitrary claims of Great Britain." "Reason and the Constitution," said Otis, "are both against this writ. . . . All precedents are under the control of the principles of law. . . . No acts of Parliament can establish such a writ. . . . An act against the constitution is void." John Adams said of him, "Otis was Isaiah and Ezekiel united—Otis was a flame of fire—Otis' oration against writs of assistance breathed into this nation the breath of life." From this time on, Otis was one of the foremost Revolutionary spirits. He sat in the state legislature. He was an active member of the congress which met at New York in 1765 to protest against the passage of the Stamp Act. He took a hand in drafting the various memorials forwarded to King George. In 1769 he became involved in a quarrel with one of the English customs commissioners. He received a blow on the head from the consequences of which he became temporarily deranged. He was afterward elected to the legislature and served in the battle of Bunker Hill, but his reason was so greatly unbalanced that he lost his place as a leader. He was killed by lightning. See WRITS OF ASSISTANCE.

Ottawa, Ontaria, the capital of the Dominion of Canada and the seventh city in the Dominion, is beautifully situated on the Ottawa River just below the Chaudiere Falls and at the confluence of the Rideau and the Ottawa. By rail Ottawa is 116 miles west of Montreal. It is served, by way of the Rideau Canal, by lake steamers, and rail service is provided by the Grand Trunk, Canadian Pacific, Canadian Northern and New York Central railroads, and by an interurban electric line.

DESCRIPTION. Ottawa is situated in a region of rare scenic beauty. Just below the city are the Rideau Falls of the Rideau River. It is built on a group of hills, some of which rise more than 150 feet above the Ottawa River. The city is on the south bank of this river, and is divided in its center by the Rideau Ship Canal. This canal forms the dividing line between the English and French sections of Ottawa, or the Upper (western) and Lower (eastern) towns. Upper Town is the most beautiful section, containing as it does the greater number of Ottawa's noteworthy buildings and monuments, and the best residential sections.

Of chief interest to the visitor are the Dominion Parliament Buildings. They cover about four acres and are built of Canadian and New York sandstone. The buildings are in a modified Italian Gothic style, and form three sides of a quadrangle; the south front, 500 feet long, is the Parliament building proper. The hill on which these buildings stand is known as Parliament Hill, and can be seen from almost any part of the city. The cornerstone of the main building was laid in 1860 by Edward

VII (then Prince of Wales) of England. The central building was damaged by fire in 1915.

Other notable structures are the Roman Catholic Cathedral, the Basilica, the Royal Mint, National Art Gallery, the Grand Trunk Railroad's palatial hotel, known as the Chateau Laurier, Christ Church Cathedral, Victoria Museum, Dominion Archives, Rideau Hall, Central Canadian Experimental Farm, Agricultural and Industrial Exhibition Building and the Carnegie library.

Parliament Hill is also set aside as a park, and here are to be found statues of such famous Canadians as Alexander Mackenzie, Sir John A. Macdonald and Sir George E. Cartier. There are several other parks in the city, the total parked area being about 2,000 acres.

Education. The Dominion capital is important as an educational center. It is the seat of Ottawa University, and also has, besides the excellent public schools, Ashbury College for Boys, La Salle Academy for Boys, Ottawa Ladies' College, a Provincial Normal School, two collegiate institutes, a technical school and numerous special and private schools.

Industry. The industrial life of the Dominion capital is represented by more than 450 establishments. In these are produced paper, matches, cement, mica, iron, clothing, lumber, metal and wood specialties, carbide, steel and many other articles. The number of factories was about doubled in the ten years between 1913 and 1923. The increasing development of hydro-electric power acts as a constant stimulant to industrial activity.

History. The explorers under Champlain visited the site of Ottawa as early as 1613, but, though in 1800 the germ of a settlement was planted across the river from the present Ottawa at what is now Hull, no settlement was established on the Ottawa side until 1827. To do honor to the builder of the Rideau Canal, Colonel John By, the settlement was named Bytown; this town was incorporated in 1854; its name was changed to Ottawa; and in 1858 Queen Victoria designated it as the Dominion capital. Seven years later the first Parliament met in the new capital.

Ottawa River, one of the important Canadian streams, is the principal tributary of the St. Lawrence. It rises in the Laurentian divide, 160 miles north of Ottawa, flowing first west, then southeast and east, emptying into the St. Lawrence by the two mouths between which lies the Island of Montreal. The Ottawa is 685 miles long, the greater part of its length forming the boundary between the provinces of Ontario and Quebec. Into it flow the Rideau, Madawska, Gatineau and Rivière du Lièvre rivers.

The Ottawa, with its tributaries, forms the means of transit for one of the largest lumbering industries in the world. Dams and slides have been constructed at many points to facilitate the passage of timber around the numerous falls and rapids. At Kingston the Ottawa is connected with Lake Ontario by the Rideau Ship Canal. About 250 miles of the river have thus been rendered navigable.

Otter, a large animal of the weasel tribe. The American otter is about forty-five inches in total length, one-third of which may be allowed for the tail. The head is large and flat. The body is comparatively slender and capable of following anywhere that the head can pass. The otter is an aquatic animal nesting in burrows like those of the beaver or muskrat. It lives chiefly on fish, which its palmated feet and muscular body enable it to pursue with inconceivable swiftness. The otter is a very shy animal, yet not infrequently it establishes itself in a suitable pond near a town or farmhouse, and succeeds in concealing its presence for many years. In the wild, it is fond of sliding down a bank plump into the water, climbing up, and sliding down again, with all the zest of a schoolboy. Its fur is exceedingly valuable. The otter of Great Britain appears to be a somewhat different animal. It likewise inhabits the banks of rivers and feeds on fish. Otter hunting with dogs is a favorite sport in England. The fur of a South American otter, called *nutria,* is well known in the London and Leipsic markets. See Fur.

Otter, Sir William Dillon (1843), a Canadian soldier, was born near Clinton,

Ontario, and studied at Upper Canada College and at the Royal Military School, Toronto. Sir William saw his first service in the Fenian raid, 1866. He was commandant of the School of Infantry, Toronto, in 1883-89, and, during the second Riel (Saskatchewan) Rebellion, (See SASKATCHEWAN REBELLION) he commanded a column under General Middleton and was first in command during the fighting at Cut Knife Creek. Sir William saw his most notable service during the Boer War, when he commanded the first Canadian forces to enter that conflict. Promotion followed rapidly; in 1910 he was made major general. From 1886 to 1905 he commanded the second Canadian military district, and commanded the Western Ontario district from 1905 to 1908. From the latter year until 1910 he was chief of the general staff, and was inspector-general and chief adviser to the Minister of Militia from 1910 to 1912, when he retired. He was knighted by King George V in 1914.

Ottoman Empire. See TURKEY.

Ottumwa, Iowa, a manufacturing city and the county seat of Wapello County, is on the Des Moines River and on several railroads, 90 miles southeast of Des Moines. It is in a rich agricultural and coal mining region, and is a shipping point for coal, fruit, grain and live stock. Power developed from the river is an industrial asset. The principal industry is meat packing, the largest plant in the world being located here, with sales running as high as $65,000,000 in a single year. Next in importance are agricultural implements and mining tools. Some of the most powerful electric hoists ever made have gone from Ottumwa factories to the salt mines of New York, the copper mines of Michigan, the coal mines of West Virginia and the gold mines of California. Other manufactures include boilers, pumps, engines, wagons, clothing, flour and paper. There are also foundries and stone quarries.

Ottumwa contains St. Joseph's Academy, high and graded schools, a Carnegie library and a Federal building. In 1920, the population was 23,003.

Ouida. See RAMÉE, LOUISE DE LA.

Ounce, ouns, in zoölogy, a leopard found up to a height of 1,200 feet in the mountain ranges of Asia. In the cold heights of Central Asia it corresponds to the lynx of North America. See LYNX.

Ounce, a measure of weight. The ounce and inch are both akin to the Latin *uncia,* meaning a twelfth. An ounce is the twelfth part of a pound Troy, or the sixteenth part of a pound avoirdupois. The Troy ounce contains 480 grains; the avoirdupois, 437½. The abbreviation is oz. See METRIC SYSTEM; AVOIRDUPOIS.

Our Mutual Friend, a novel by Charles Dickens, published in nineteen installments during 1864-65. This is one of Dickens' most entertaining stories, although, so far as plot goes, one of the most improbable. The story is based on the assumption by two simple old people of characters wholly foreign to their true nature in order that they may teach to a warmhearted but ambitious girl the fact that wealth brings oftentimes temptations and evils in its train. Many interesting personalities appear in the course of the story. Jenny Wren, the doll's dressmaker; Silas Wegg, who "dropped into poetry"; Pleasant Riderhood, always twisting up her hair; the Golden Dustman; Lizzie Hexam, and the Veneerings are people whom everyone wishes to know.

Outcault, Richard Felton (1863-), an American comic artist, creator of the well known *Buster Brown* and *Yellow Kid* series of illustrations. He was born at Lancaster, Ohio, and educated in Cincinnati. Mr. Outcault began his career as a comic artist in 1895, when his *Hogan's Alley* series first appeared in the New York *World.* His *Yellow Kid* series began in the New York *Journal* in 1896. Next came *Pore Lil Mose* and *Buster Brown.* Mr. Outcault was on the staff of the New York *Journal* for several years. In book form his creations have appeared under the titles *Buster, Mary and Tige, Buster Brown, the Busy Body, Real Buster and the Only Mary Jane* and *Buster Brown and His Pets.*

Outram, Sir James (1803 - 1863), a British soldier who played a leading part in the history of British India. He was

born at Butterley Hall, Derbyshire, and was educated in Scotland. He received his commission and went to India as a cadet in 1819. In various conflicts against the Dang tribes, and in the Afghan War of 1839, he served with signal honor. Ill health forced Sir James to return to England in 1856, but in 1857 he joined the British expedition agains the Persians. During the Sepoy rebellion of 1857 Sir James won his greatest distinction. He was offered command of the forces sent to the relief of Lucknow, but refused to take precedence of his friend Havelock, and took up only his civil appointment as Chief Commissioner of Oudh. After the relief of Lucknow, Sir James took a large part in the final overthrow of the insurgents. In 1860 he received the thanks of Parliament. In the same year ill health again forced him to return to England. Sir James became known as the "Bayard of India;" his dealings with the Indian natives were always marked by fair play and generosity.

Ouzel, an old German name for several birds of the thrush kind. The American water ouzel, or dipper, as it is frequently called, is a native of the Rocky Mountains and coast ranges. It builds an ordinary cup-shaped nest and incloses it in a huge mass of moss, which it enters like a mouse by a small opening at the side. It is a small, short-tailed, short-winged, dark colored, wren-like bird. It lives in the cañons along the mountain streams. Its food consists chiefly of the snails and insects found in such localities. Although formed like other dry land birds, it is fond of diving. It flutters through the water with the aid of its wings, and may be seen chasing along the bottom for one or two minutes at a time searching for its favorite food. Among other tricks the bird is fond of dropping into a waterfall and emerging at the foot below. Wherever there is a stretch of mountain stream, eddies, and swift currents, a pair of swiftly diving ouzels is sure to be found. Olive Thorne Miller's *A Bird-Lover in the West,* gives an account of the ouzel and its habits. Keyson describes the water ouzel as "a mouse-colored bird a little smaller than the robin, his tail perked up almost vertically, scuttling about on the rocks and dipping his body in an expressive way like a 'tip-up' sandpiper."

Oven-Bird, a brownish, olive-green, woodland bird about six inches long. It belongs to the warbler family. It breeds in the eastern part of North America, and winters on the Gulf and southward. A bulky nest of coarse material is built on the ground with an entrance at one side. The female lays four or five white eggs spotted with cinnamon. The call or song of the oven bird is written by John Burroughs as "teacher, *teacher,* TEACHER, TEACHER, *TEACHER.*"

Ovid, ŏv'id (43 B. C.-18 A. D), a Roman poet. A study of Ovid's life exhibits him as a leader in a gay and profligate company, not unlike that which flourished in France at one time and at the English court after the Restoration. His *Art of Love,* an extensive work, pictures the society in which he moved. Ovid is remembered, however, for his *Metamorphoses,* much read in school as a text book of classical mythology. It consists of poetical narratives of all the transformations described in legend and tradition up to the time of the death of Julius Caesar. Milton's *Paradise Lost* is said to owe much to Ovid. For some unknown offense, possibly slight, Ovid was banished by the Emperor Augustus. He petitioned humbly to return, but he was refused. He lived ten years in grief and died an exile.

Owen, David Dale (1807 - 1860), an American geologist, the son of Robert Owen. He received a degree from the Ohio Medical College, and for several years studied abroad. Upon his return to the United States, he became head of the Indiana Geological Department, made a survey of the state, and in 1839 was employed by the United States Government to make a report on Iowa's mineral resources. This work he repeated in several other states. Owen made many contributions to scientific journals on geological subjects, these having reference chiefly to his work in the Middle West. With others, he was also engaged on a work entitled *A Report of a Geological Survey of Wisconsin, Iowa and Minnesota, and, incidentally, of a Portion of Nebraska Territory.*

Owen, Sir Richard (1804-1892), a noted English zoölogist. He was educated as a surgeon and held important positions in various London institutions of surgery. In 1856 he was placed in charge of the natural history collections of the British Museum. He is to be credited with their arrangement in the new quarters at South Kensington. He wrote a number of authoritative works, as *History of British Fossil Mammals and Birds, Fossil Remains of Extinct Mammals of Australia,* and *Extinct Wingless Birds of New Zealand.* It is said that he could give a shrewd guess at the size and form of a quadruped from seeing a single tooth. His knowledge of anatomy was such that, when a bone from New Zealand was brought to him, he was able to say it was a bone from the leg of a bird of the ostrich kind, only larger. He even ventured to sketch this bird, then unknown to science.

Owen, Robert (1771-1858), a wealthy cotton spinner of Manchester, England He was a native of Newtown, Wales. He was a man of ability and of philanthropic views. In 1814 he organized a new company, including Joseph Fox and Jeremy Bentham as members. They established mills at New Lanark, Scotland, and operated them on the principle that they should be managed for the benefit of the wage-earners. No children were employed. Improved houses were provided at nominal rent. A system of insurance against sickness and helpless old age was inaugurated. All profits over five per cent were set aside for the improvement of the village and the comfort of its people. Later, Owen retired from the management of the mills and devoted himself to the spread of socialist ideas. He memorialized Parliament on the subject of obviating poverty by the establishment of coöperative villages to which the poor might be removed. He himself established the coöperative community of Orbiston in Lanarkshire and a second socialistic community at New Harmony, Indiana. Neither proved successful. In his later days, he was a leader among the spiritualists. Owen's views may be had in detail from the following quotation taken from the *Britannica:*

He recommended that communities of about twelve hundred persons each should be settled on quantities of land of from 1,000 to 1,500 acres, all living in one large building in the form of a square, with public kitchen and mess-rooms. Each family should have its own private apartments, and the entire care of the children till the age of three, after which they should be brought up by the community, their parents having access to them at meals and all other proper times. These communities might be established by individuals, by parishes, by counties, or by the state; in every case there should be effective supervision by duly qualified persons. Work, and the enjoyment of its results, should be in common. The size of his community was no doubt suggested partly by his village of New Lanark; and he soon proceeded to advocate such a scheme as the best form for the reorganization of society in general.

See SOCIALISM; NEW HARMONY; COMMUNISM.

Owen, Robert Dale (1800-1877), a Scottish-American reformer. He was the son of Robert Owen, and was born at Glasgow. In 1825 he came to America to superintend affairs at New Harmony. Later, he attempted to establish a community near Memphis for free negroes. For a time he was the editor and publisher of a socialist paper in New York, called the *Free Enquirer.* In 1835 he was elected to the legislature of Indiana, and eight years later he was sent to Congress as a Democrat. He took a prominent part in the founding of the Smithsonian Institution and in the settlement of the Oregon boundary dispute. He was minister to Naples in 1855. He became a prominent Abolitionist. His later days were spent in advocacy of Spiritualism, the subject of several works, including *Footprints on the Boundary of Another World,* etc. An *Autobiography* gives an interesting account of his early life. See COMMUNISM.

Owen, Robert Latham (1856-), an American attorney and legislator, was born at Lynchburg, Virginia. After graduating from Washington and Lee University in 1877, he began practicing law in Virginia, and later in Muscogee, Okla.

In 1892 he became active in politics, serving as Democratic National Committeeman from that year until 1896. In 1906 he became vice chairman of the Democratic National Committee. Always having been a strong champion of the Indians,

he now put through a bill granting citizenship to all Indians of the Territory. When Oklahoma became a state Owen was twice elected Senator and helped to frame the famous Glass-Owen Act, creating a regional reserve banking system.

Owensboro, Ky., the county seat of Davies County, is on the Ohio River, 114 miles southwest of Louisville. It is served by the Louisville & Nashville, the Illinois Central and Louisville, Henderson & St. Louis railroads. This city is situated in a fertile agricultural and stock raising region, and near it are valuable deposits of coal, building stone, clay, iron, zinc and lead. It is one of the largest leaf and strip tobacco markets in the United States. Its manufactures include flour and grist mills, wheels, buggies, lumber, wagons, stock feed, chairs, automobile bodies, ditchers, furniture, flour and tobacco products.

Owensboro is the seat of St. Francis Academy and has a large senior high school, junior high school, graded schools and a Carnegie library. The population was 21,424, in 1920.

Owen Sound, Ontario, the county town of Grey County and a port of entry, is on Georgian Bay at the mouth of the Sydenham River, 122 miles northwest of Toronto. It is served by the Grand Trunk and the Canadian Northern railroads and by several lines of steamers. Owen Sound is an important manufacturing center, with factories producing finished lumber, furniture, steel, malleable iron, confections, flour, sashes and doors, mattresses, boats, stoves, agricultural implements, nails, water turbines, knit goods, etc. Abundant hydroelectric power is available for industrial purposes.

Owen Sound is important commercially by reason of its fine harbor on the sound, which is twelve miles long. The city is popular as a summer resort, offering excellent boating and bathing facilities. There are two parks, a library, modern primary and high schools, good hotels and two theaters. In 1921, the population was 12,190.

Owl, a family of birds of prey. The owl is known at once by its large feathery face and great wise eyes immersed in depressed circles of plumage. The owl is unable to roll its eye or to look sidewise without throwing its head around. The bill is half hid in feathers. It is curved from the base like that of a hawk, and is well adapted to rend prey. The claws are sharp and curved for seizing, but are less powerful than those of a hawk. In order to surprise its prey, the flight of an owl is swift and noiseless. Most owls see better at dusk than in the daytime. For that reason they feed at night and seldom molest poultry, but live chiefly on rabbits, mice, insects, and other animals that move in the night time. A study of the stomachs of many hundred owls has demonstrated that, by the destruction of mice, they are to be regarded as more useful than otherwise. The owl eats its food, hair, feathers, and all. It is said that its health actually fails if fed on pure beefsteak. Hair, bones, and feathers are formed into pellets and cast up through the mouth. A study of these pellets gives a clue to the diet of the owl. In the Northern States owls nest in February. The eggs of an owl, usually two to four in number, are uniformly white and are almost hemispherical. In perching, the owl has the power to reflex the outer toe at will, thus grasping the perch with three toes forward and one backward, or two forward and two backward, thus giving it a firmer hold.

There are eighteen kinds of owls in North America north of Mexico. The smallest is the elf owl of Arizona, six inches long; the largest is the gray owl of the Arctic region, thirty inches in length. Several species of barn owls are found throughout the northern hemisphere. The common American barn owl is a peculiar looking chap, eighteen inches in total length. The plumage clings tightly to the body. The face has a peculiar, monkey-like appearance, quite different from that of other owls. The barn owl takes shelter in church belfries, hay mows, hollow trees, and the like. It lives chiefly on rats and mice. The nest is placed usually in a tower or stable or a hole in a tree or bank. There are from five to nine eggs. A pair nested for years in one of the towers of the Smithsonian Building in Washington. A pair of barn

1. Common wood owl. 2. Hooded owl. 3. Marsh owl. 4. Barn owl. 5. Great horned owl. 6. Sparrow owl.

OWLS OF EUROPE.

owls is considered better than a cat to rid the premises of rats and mice.

The screech owl is a small, bunty little fellow about nine inches in length. It nests in barns and hollow trees. In New England its favorite retreat is an old apple orchard. When discovered in the daytime, the small birds annoy it with impunity; but, as night draws on, they are careful to absent themselves. Mr. Fisher, who examined the stomachs of 255 screech owls for scientific purposes, found that their food consists of small birds, mice, lizards, frogs, insects, spiders, crayfish, earthworms, etc. Out of 255 specimens, he found that one had been guilty of attacking poultry.

The saw-whet owl is smaller than the screech owl. It makes a noise resembling that made in filing a large-toothed saw.

The burrowing owl nests in the abandoned burrows of the prairie dog. Its principal food is grasshoppers, crickets, and other insects. Where a burrow of this sort does not offer, it is quite capable of digging a hole for itself. The burrowing owl of Florida, about nine inches in length, digs a hole in a bank, into which it places from five to seven eggs.

The barred or hoot owl places from two to four eggs in an old crow's or hawk's nest. It is without horns. The upper parts are grayish brown. The under parts are white, more or less tinged with buff. The breast is barred.

The call of the large forest owls is certainly startling. Some entertaining sketches are given by William J. Long. Chapman describes the usual call of the barred or hoot owl as "a striking medley of *whă-whăs* mingled with rolling *whōō-ăhs,* the whole reminding one of deep-voiced, mirthless laughter. Sometimes two birds give a concerted performance. One utters about ten rapid hoots, while the other, in a slightly higher tone, hoots half as fast, both performers ending together with a *whōō-ăh.* At times, they utter a single prolonged *whōō-ăh,* and, more rarely, a weird, gasping shriek emphasized at its conclusion like a cry of distress." The call of the great horned owl he gives as a "loud, deep-toned *whoo, hoo-hoo-hoo, whooo, whooo.* The syllables are all on the same note, and bear some resemblance to a bass-voiced dog barking in the distance. A much rarer call is a loud, piercing scream, one of the most blood-curdling sounds I have ever heard in the woods."

In time of abundance the owl is a liberal provider. A nest of great horned owls examined by a bird student was found to contain two young owls. The larder contained a mouse, a young muskrat, two eels, four bullheads, a wood duck, four ruffed grouse, one rabbit, and eleven rats, in all eleven pounds of food.

Great horned owl (American).

The snowy owl is twenty-five inches in length. It is of a pure white, more or less barred with brown or black. It breeds near the Arctic Circle. It nests on the ground. It hunts in the daytime. In winter it wanders southward looking for food. In winter this beautiful white bird may be seen coursing over the snowy plains of Minnesota, Dakota, and Montana. It lives on snowbirds, prairie chickens, grouse, sage hens, rabbits, and the like. Once in a while it gets as far south as Texas before turning homeward for an arctic summer. It

is the handsomest of the American owls. Some individuals are almost spotless white.

The eggs of all owls are white. In the northern United States and Canada the owls nest so early in February that they are obliged to stay on the nest continuously to keep the eggs from freezing.

In literature, the owl holds a double place as a bird of ill omen and as the especial companion of Minerva, the goddess of wisdom. A stuffed owl is regarded as an appropriate ornament for the library. An owlish person is one who looks pompous and over wise. The word, owl, is also used provincially as a verb meaning to carry on a prowling business at night. Gray's solemn stillness of the churchyard is skillfully intensified by

> Save that from yonder ivy-mantled tower
> The moping owl does to the moon complain
> Of such as, wandering near her secret bower,
> Molest her ancient, solitary reign.

> Then nightly sings the staring owl,
> Tu-who!
> Tu-whit! tu-who! a merry note,
> While greasy Joan doth keel the pot.
> —Shakespeare.

Oxenstiern, ŏks′en-stērn, **Axel, Count,** (1583-1654), a Swedish statesman. He was born in Fano, Upland. He was a student of theology first, and later of law, studying at Rostock, Wittenberg, and Jena. In 1603 he served as the minister of Charles IX to Mecklenburg. Nine years later he was made chancellor, upon the accession of Gustavus Adolphus to the throne. He accompanied the king on his campaigns in Germany.

At the death of Gustavus Adolphus on the field of Lutzen, in 1632, Oxenstiern's power became unlimited, and he remained sole head of the Protestant League. In 1636 he returned to Sweden, and used his influence with Queen Christina to bring about peace between Sweden and Germany. The peace effected in 1645 was distasteful to the queen, and the statesman's interference with politics was looked upon with such disfavor that he at length withdrew entirely from public life.

Oxford, one of the two university cities of England. It is situated on the Thames in Oxfordshire, about fifty-two miles northwest of London. The river at this point is known as the Isis. The city is mentioned in the English chronicles as early as 912. It is supposed to have grown up at a point where oxen forded the river. It was surrounded formerly by walls, a portion of which still exists as part of the exterior wall of the New College gardens. The keep of the ancient city still stands. The university for which the city is noted was founded, it is believed, in 1164. The earliest authentic mention of the university of Oxford, however, dates from 1201. The university differs materially from an American institution. It consists of a group of colleges doing practically the same work. Each has its own buildings and government.

It is a little difficult for an American to understand the organization of Oxford University. If a score of our denominational and endowed colleges had been founded in some one town and had combined for certain purposes of administration and of granting degrees, while each college retained its own buildings, faculty, dormitories and funds, we should have had an association of colleges something like that known as Oxford University. Named in order of foundation, the colleges are known as University, Baliol, Merton, Exeter, Oriel, Queen's, New, All Souls', Magdalen, Brasenose, Corpus Christi, Christ Church, Trinity, St. John's, Jesus, Wadham, Pembroke, Worcester, Hertford, and Keble.

Men only are admitted. Four colleges for women, known as Somerville, Lady Margaret's, St. Hugh's, and St. Hilda's Halls, have been established; but degrees are not granted to the students. The leading college is Christ Church, established by Cardinal Wolsey in 1525 as Cardinal College. It was refounded as Christ Church by Henry VIII in 1546. It is heavily endowed. Oxford students are required to attend lectures, but the greater part of the instruction is given in private. Each student is required to attach himself to a tutor or private teacher, who directs his studies. The students live in the dormitories attached to the various colleges, and dine in public halls. Degrees are granted by a governing body representing the various colleges. According to the time-honored routine at Oxford, the student's fore-

noon is given to lectures, to study, and to work with the tutor; the afternoon is devoted to outdoor exercises; the evening is spent in reading, in attending literary exercises, or in social amusement, as may be desired. The strictness with which the student is held to profitable work depends entirely on the tutor. To obtain a bachelor's degree it is necessary to pass three examinations, known locally as "Smalls," "Mods," and "Greats." It is difficult for a student to meet the ordinary charges of the university for lodging, board, and tutor short of $800 a year. Those who have taken degrees are eligible to appointment as fellows. The fellows receive an annual grant, varying from $750 to $1,250, enabling them to live independently. They are at liberty to pursue their studies at the university or to travel. The fellowship terminates usually on marriage or settlement in a profession.

Oxford is preëminently a university town. It is a city of towers, spires, and quadrangles. There is abundance of green grass and a profusion of carved stonework. Fine old gateways lead from one quadrangle to another, which, with the total absence of manufactures, give the town a quaint, medieval, scholastic air, very delightful to the student and tourist. The present population of the city, including tradespeople, citizens, professors, fellows, tutors and students, is about 50,000.

See BODLEIAN; CAMBRIDGE; CLARENDON PRESS; RHODES.

Ox-Warble. See BOT-FLY.

Oxygen, ŏks'ĭ-jĕn, an elemental gas, without color, taste, or odor. Its most prominent characteristic is its power to burn up many substances, that is to say, to unite with them and give off heat and light during the process. Substances which burn or unite with oxygen are said to be combustible. Burning bodies obtain oxygen usually from the air. If the air is shut off burning ceases. Oxygen was discovered by Priestley in 1774, and was named by the chemist Lavoisier. It is the most abundant element in the world. It forms one-fifth of the air, eight-ninths of the water, and from forty-four to forty-eight hundreths of the solid crust of the earth. It enters into combination with other elements to make up the structure of all plants and animals. Animals breathe air that the blood may absorb oxygen. Animal heat and energy are supplied by the action of oxygen. A combination of oxygen with another element is called an oxide. Thus we have mercuric oxide, zinc oxide, silver oxide, oxide of iron, etc. A dioxide is a compound with a double quantity of oxygen. Carbon dioxide, for instance, is a union of carbon with a double quantity of oxygen. The rusting of iron is the slow formation of an iron oxide. It is interesting to know that under a pressure of fifty atmospheres and a temperature of —119° C., oxygen becomes a pale, steel-blue liquid, and that it may be frozen into a white solid. See OZONE; WATER; AIR; SAND; SUGAR; FIRE.

Oyster, a marine bivalve, or shellfish, much used for food. For a general description of the oyster, see article on the CLAM. An oyster may be distinguished from a clam, however, by the fact that the lower side on which the oyster lies is more rounding than the flat upper valve which acts more as a lid. As it does not travel the oyster has no foot like that of the clam and the snail. The oyster, like the mussel, lies in the water with its valves parted slightly. The hinge is near one end, and the water from which the oyster selects its food passes in, not by a siphon tube, but along the curved border and out at the straight border, being impelled by cilia, or waving, hair-like bodies. The young oysters are set afloat and swim a few days. A small shell then begins to develop, and the young oyster attaches itself to some object to which it becomes cemented for life by the bony material of the forming shell. Ordinary oysters are large enough to gather when four years old. Blue-points are ready at three. Oysters fresh from the water are fit to eat at any season, except from June to August. These months are the spawning season during which oyster fishermen desire to leave the oysters to breed. For these reasons it is just as well to heed the common saying that oysters are good only in months containing the letter R.

There are about seventy species of oysters well distributed around the warmer seas. The common European oyster is gathered along the Atlantic from the coasts of Nor-

way and the Baltic to a point as far south as the Mediterranean Sea. About 6,000,000 bushels of oysters are gathered annually in European waters. Half a million bushels of California oysters are gathered on the Pacific coast. The Virginian oyster is the most desirable species for food. When America was first colonized this oyster was found all along the coast from the St. Lawrence to the Gulf of Mexico. With the exception of beds in the Bay of Chaleur and on the coast of Prince Edward Island it has disappeared north of Cape Cod. Oyster fisheries still extend along the Atlantic coast from Cape Cod to Texas, with the center of the industry in Chesapeake Bay.

Oysters are collected with a dredge, the bottom of which is shaped something like a comb. The oysters are torn loose by the teeth. They are caught in a bag which drags behind, and are brought to the surface. The annual oyster catch of the United States is from 37,000,000 to 45,000,000 bushels, worth about $2.50 a bushel at the wharf. The finest oysters are taken off the coast of Maryland and Virginia. Baltimore is the great oyster emporium of America,—the great oyster city of the world.

Oyster-Catcher, a shore bird, a sort of surf-plover. It is from seventeen to twenty-one inches long and has a long, stout, crab-red bill, compressed toward the end into the form of a knife blade. It stalks in a dignified manner along the shore on the outlook for clams and oysters with their shells partly open. Before the shell can close it thrusts its bill in and twists the valves apart. If unable to do this, it hammers the clinging shell to fragments on a stone. The bird has webbed toes and half flies, half wades along shallow water, hunting shrimps and limpets. The latter are pried from the rocks with ease. This bird nests in the hot sand. It is worthless as a game bird. There are ten species of oyster-catchers, represented in most of the warmer parts of the globe. Only three species are found on the coasts of North America.

Ozone, a colorless gas with the odor of air after a thunderstorm. It is, in fact, condensed oxygen. It is highly destructive of offensive odors, and is, in general, an active purifier. In nature, the air of high altitudes and cool, wind-swept prairies is supposed to contain more or less ozone. It is highly favorable to active, energetic animal life. Ordinarily two atoms of oxygen unite to form one molecule, but three atoms of oxygen unite to form a molecule of ozone. Three volumes of oxygen form two volumes of ozone. Ozone is formed by nature during thunderstorms. An electrical discharge is accompanied by the making of ozone. When an electrical machine is operated rapidly, the pungent, offensive odor that arises is due to ozone. On the principle that two are good company and three are none at all, the third atom of the ozone molecule is dissatisfied—eager for other company. When ozone and bacteria—germs—come together, the third atom seizes the hydrogen of the bacteria. The result is oxygen and dead bacteria. For this reason ozone is the natural foe of the germs of tuberculosis; and for this reason consumptives find relief in sleeping in the open air, where ozone is most abundant.

The same eagerness of the third atom to enter into another combination makes ozone a valuable gas for many purposes. It is manufactured by the use of electrical discharges and is used in many of the arts. It is used to refine oils; to whiten wax, ivory, and bone; to bleach feathers and cotton goods; to harden the wood used in musical instruments, and for many other purposes. In Paris, ozone is used to purify the linen from hospitals.

The destructive effect of ozone upon bacteria has been put to good account by the citizens of Philadelphia. A municipal plant manufactures ozone and uses it in the purification of drinking water. Samples of water known to contain as high as 720,000 bacteria were treated with ozone. The average number of living bacteria was reduced, it is believed, to twenty-five per sample.

Ozone tarnishes silver, it bleaches indigo, corrodes cork, hardens India rubber, and turns moist litmus paper blue.

See OXYGEN: BACTERIUM; TUBERCULOSIS.

P

Pacer, a horse with a peculiar gait. First the two feet on one side are lifted, then the two feet on the other. It is said that U. S. Grant was fond of a pacing horse, and that when a boy he taught the horses on the farm to pace, but that he could not be induced to train horses for the neighbors. One neighbor hit upon the ruse of employing Ulysses to go on a long errand with one of his horses, and, as he expected, the lad trained the horse to pace ere he got back. See HORSE RACING.

Pacific (pa-sĭf'ĭk) **Ocean,** that part of the sea lying between America, Asia, and Australia. It is known also as the South Sea. The name Pacific was given by Magellan, who entered from the stormy waters of Cape Horn in 1520 and found comparatively smooth sailing. It was first seen in 1513 by Balboa. The northern extremity is marked by Bering Strait. The southern boundary is fixed usually at the Antarctic Circle. It is divided by the equator into the North and the South Pacific. By some that part between the tropics is called the Central Pacific. The greatest breadth from east to west is more than 10,000 miles. The greatest known depth, found east of the island of Guam, is 31,614 feet. The bottom of the Pacific consists chiefly of red clays, ooze, and coral muds. Area, 70,000,000 square miles, greater than the entire land surface of the globe.

The Pacific is the largest ocean and the deepest ocean. It contains one-half of the world's salt water. Owing to the nearness of the mountain ranges to its coast, it receives less water from rivers than is received by the Atlantic. The Pacific rivers of South America are all short mountain streams. It receives two large streams from North America, — the Columbia and the Yukon,—and three from Asia, the Amur, the Hoang-ho, and the Yangtse. The drainage basin of the Pacific is about half that of the Atlantic. For an account of the islands of the Pacific, the reader is referred to articles on GUAM, GALAPAGOS, NEW ZEALAND, PHILIPPINES, JAPAN, and FORMOSA.

The tides of the Pacific rise from one to two feet in midocean. Along the coast of North America high tide rises usually ten feet. For reasons similar to those which govern the high tides of the Bay of Fundy, Cook's Inlet, Alaska, has a tide of twenty-eight feet. Tide rises in the pocket of Panama from thirteen to fifteen feet. The chief currents are the equatorial, flowing westward on either side of the equator at from a mile to a mile and a quarter an hour; the Japan, which passes up the eastern coast of Asia and down the western coast of North America, and a similar current in the Southern Pacific, known off South America as Humboldt's Current. The swiftest current in the ocean is that which passes Japan with a speed of thirty-one miles in twenty-four hours.

Packing House, an establishment in which provisions, especially beef and pork, are packed for preservation or for the market. The business of a packing house includes the slaughtering of food animals, with the utilization of their carcasses and bi-products, and in the aggregate constitutes an important American industry of which the city of Chicago is the center. The census of 1920 reported the slaughtering and meat packing industry, in fact, as the largest single manufacturing industry in value of output in the United States. There are a large number of companies engaged in this business, and they are widely scattered over the United States, although the largest and best known have mammoth plants grouped in the Union Stock Yards, Chicago. There was a total of 1,300 packing plants reported for 1919, a slight increase over the number in 1914, before the war. Another indication of the number in 1914, before the war. Another indication of the number of plants engaged in the business is found in the figures of the Department of Agriculture on the number of government-inspected slaughtering plants. On June 1,1920, these numbered 895 establishments, located in 163 cities.

About two-thirds of the meat supply of the United States is raised west of the Mis-

sissippi River, and about two-thirds of the population is east of the Mississippi River. This situation makes necessary the long-distance and national distribution of meats, and has encouraged the growth of great packing concerns. To supply the domestic demand, two types of meat distribution are needed in the United States, one local and the other long-distance. Each requires a different type of organization. Small slaughtering and packing plants and corresponding equipment are necessary for local distribution. Large plants with branch houses or distributing agents, and refrigerator cars are necessary for national distribution, and such plants may also do a large export business in meats and other food products.

The total number of animals slaughtered in wholesale slaughtering and meat packing establishments in 1919 was 73,256,127, an increase of 23 per cent in the five-year period which included the war years. The total cost of "materials" used in the industry in 1919 was $3,056,387,778.

On November 15, 1922, J. Ogden Armour, president of Armour & Co., Chicago, placed before the government a proposal for the consolidation of Armour & Co. and Morris & Co., two of the "big five" Chicago meat packers. Economies of operation were sought by this merger, but government approval was reserved while careful study was made at the Department of Agriculture of the details of the plan and its probable effect on the industry of the the producing and consuming public.

Armour & Co. at this time had a capitalization of $150,000,000, with assets in 1920 of $525,488,957, and has packing plants in South America and Australia, as well as in the United States. Its sales exceeded a billion dollars in 1919 and were over $900,000,000 in 1920. Morris & Co. was capitalized at $40,000,000, with assets in 1920 of $116,843,021. The company had half a dozen packing plants in the United States, with distributing stations here and in the more important cities of Europe and in Cuba.

Swift & Company, another of the Chicago "big five" packers, was started about half a century ago by Gustavus F. Swift on a borrowed capital of $20. When first incorporated Swift & Company had six shareholders. The nation was growing and needed meat, and the young corporation grew also. The first little plant at Barnstable, Mass., has been replaced by 23 modern packing plants strategically located for business. More than 400 branch houses and 600 car routes distribute the meat carried in over 6,000 refrigerator cars. Nearly 50,000 men and women are employed by Swift & Company, of whom 16,000 also are shareholders.

The founders of the modern packing industry were the originators of meat refrigerator cars. Today over 15,000 refrigerator cars are owned by the large packing companies of Chicago, and a total of over 22,000 refrigerator cars are owned by all packing companies.

Fresh meat is easily contaminated and it is necessary to keep cars for meat fresh and clean. The packer maintains that by owning his own cars he is able to give them more careful and personal attention in this respect than if they were owned by the railroad companies with no personal interest in the condition of their perishable freight. Refrigerator cars constitute one of the most important pieces of physical equipment in the marketing of packing-house products, because whether meats are sold through branch houses or by car routes, or through jobbers or wholesalers, they must be transported from packing plants to destination under refrigeration. The refrigerator car, therefore, is a highly essential link in this chain of distribution.

During the growth of the larger packing companies, covering a period of approximately 40 years, they have developed their own selling agencies in the more densely settled parts of the country, in the form of branch houses. Branch houses are used by all of the larger companies, and to a less extent also by smaller companies. Through these branch houses the companies owning them distribute their products at wholesale to retail dealers. They handle fresh and cured meats of all kinds, meat specialties, poultry, eggs, butter, cheese, olemargarine, lard, shortening, cooking and salad oils, and soap. The larger

packers operate over 1,100 branch houses, the majority in the eastern states, but spread quite generally over the country. They are located either in large cities or else in medium-sized cities having a number of towns nearby which can be conveniently supplied by express or motor trucks.

A small amount of processing meats is done in some branch houses distant from the packers' plants, such as smoking hams and bacon, cooking hams, and manufacturing sausage. Carloads of products are shipped directly from a company's packing plants to its branch houses, and these branches assist the packer in keeping in close touch with the market and its demands.

Practically all the larger packing companies operate systems known as car routes. The packer's salesman takes orders from retailers along a certain line of railroad. His orders are sent back to the plant, and a refrigerator car takes the products to their destination. This method of distribution began about 1890, shortly after the big packers began to establish branch houses. Now, (1923) there are said to be over 1,500 distinct car routes operated by packers in the Middle West and South.

Retail dealers get their supplies of meat either from small local packing plants or from the larger packing companies at a distance. The advantage of buying from local plants or branch houses is that the retailer can go to the company's coolers and select the meats he requires.

There are certain specialized classes of jobbers of meats. For example, the so-called peddler jobber has a special trade, made up perhaps of restaurants or outlying retail shops and delicatessen stores to which he caters regularly. Knowing their needs, he selects the proper grades of meats from the wholesaler or packer and delivers them to the purchaser.

There are also hotel-supply companies which buy from packing companies and specialize on such trade as hotels, restaurants, clubs, dining-cars, boats, and public institutions.

On the average only about 55 per cent of the weight of the live steer emerges from the packing house as dressed beef. That is the principal reason for the spread in price between the price of live cattle and the price of the resulting beef. Another important factor which appreciably effects the relationship between the price of beef and the price of cattle is the market value of such bi-products as hides, oleo oil, etc.

Briefly stated, a live steer is worth to the packer what he can obtain for the beef plus what he can obtain for the bi-products minus his cost of operation. So if the value of hides and other bi-products declines, the packer will try to buy livestock at a lower price because it is worth that much less to him, even though the price of beef remains the same. This widens the spread between live and dressed prices. On the other hand, a rise in the value of bi-products should cause an increase in the price of the live animals, and in this case narrows the spread between cattle and beef prices.

In much the same way that the spread between beef and cattle prices is affected by changes in bi-products values, it is also affected by changes in the packer's cost of doing business. Packing-house expenses consist principally of labor. Wages in the packing industry rose rapidly during and immediately following the war. Since that time two cuts of packing-house wages have been made by the large packers; one of 12.5 per cent in March, 1921, and the other an average of about 10 per cent on November 28, 1921. Wages in the industry are still far above the pre-war level and are one of the most influential factors in causing a wide spread between prices of livestock and prices of dressed meats.

See MEAT AND MEAT PACKING.

Paderewski, pä-dĕ-rĕf′skē, **Ignace Jan** (1860), a Polish pianist and composer. He was born at Podolia, Russian Poland. He studied at Warsaw under the great teachers there, and after concert tours of Russia and Siberia, became a professor of music in the Warsaw Conservatory at the age of eighteen. In 1884 he taught in the Conservatory of Strasburg. Shortly afterward he went to Vienna to study under Leschetizky, and in 1887 appeared formally for the first time as a concert pianist.

His success was instantaneous, and he has come to be recognized as the greatest pianist of his age. At the outbreak of the Great War, Paderewski addressed himself devotedly to the allied cause and the resuscitation of the Polish nation. In 1918 he made his debut as a statesman and became premier of the new republic of Poland, but in December, 1919, he resigned.

See POLAND.

Padua, an ancient city of Italy. It is situated twenty-two miles west of Venice on a small stream. It is connected with the Adige and with the Adriatic by canals. It was sacked by Alaric and by Attila. It entered upon an era of prosperity under the fostering care of Charlemagne. The city is surrounded by a wall still standing. There are seven gates. Numerous bridges and long colonnades or arcades following the principal streets give the city an exceedingly quaint and picturesque appearance. The principal building, as well as one of the oldest, is the town hall. Portions of it date from 1172. It stands on a number of open arches. The upper story is surrounded by a colonnade. A great hall on the upper floor is said to have the largest recess unsupported by columns in Europe. It is noted for a series of mural paintings, about 400 in number. There is also a cathedral with a fine old library. Petrarch was at one time, it may be remembered, its canon or cathedral clergyman. The city is known in literature chiefly for its university, founded in 1260. In the Middle Ages it had the reputation of possessing the ablest faculty of law and medicine in Europe. Among the professors were Galileo, the famous astronomer, and the anatomist, Fallopius, whose name is still attached to various organs of the human body. Dante, Petrarch, and Tasso are reckoned among the famous students. An inscription over the university gate ran as follows:

> So enter that thou mayst become more learned and thoughtful:
> So depart that thou mayst become more useful to thy country and to mankind.

The university is still in existence. It is attended by from 1,200 to 1,500 students. It possesses the oldest botanical garden in Europe, a library of 140,000 volumes, and an observatory. The population of the city in 1910 was 93,560. There are local manufactures of silks, ribbons, chemicals, violins, catgut, machinery, etc. Padua deserves to be remembered as an early intellectual center of Europe. The disguised Portia in Shakespeare's *Merchant of Venice* pretended to be a young doctor learned in the law, "new come from Padua."

Paducah, Ky., the county seat of McCracken County, is on the Ohio River at the mouth of the Tennessee River, 165 miles southwest of St. Louis, Mo. It is the railroad center of western Kentucky. Paducah is in a timber, mineral and agricultural region, and is one of the largest markets in the United States for dark leaf tobacco. Among its manufactures are tobacco products, lumber, pottery, clothing, furniture, bricks, cordage, flour and foundry products. It has a large boat building yard, and machine shops of the Illinois Central Railroad.

The educational institutions include St. Mary's Academy, a Carnegie library and good public schools. In 1861, General Grant occupied and fortified Paducah, and in 1864, General Forrest, with a force of 5,000, here unsuccessfully attacked General Hicks and his garrison of 800 men. Population, in 1920, 24,735.

Paganini, pä-gä-nee′nee (1784-1840), an Italian violinist. A native of Genoa. Paganini is considered the most wonderful violinist of Italy or any country. Aside from real talent he developed ability to do astonishing feats in technique. For instance, he would remove all but the G string from his violin and render pieces too difficult for anybody else to play with all the strings. He exhibited in the cities of Italy, Austria, Germany, France, and Great Britain. Monarchs and courts loaded him with favors. He retired in wealth to a villa near Parma. Of his compositions the most noted is *The Carnival of Venice.* See VIOLIN; BULL, OLE.

Page, David (1810-1848), a New England educator. Born at Epping, New Hampshire. He was educated on a farm and at the district school, supplemented by two years at Hampton Academy. Mr. Page taught district schools and was an

instructor in an academy. He attracted attention at teachers' meetings and formed an attachment for Horace Mann. In 1844 Mr. Page was appointed principal of the Albany State Normal School. This was the first school for teachers as far west as the Hudson Valley. Mr. Page was much harassed by the unwise, not to say ignorant, opposition of New York politicians. His contribution to education is *The Theory and Practice of Teaching,* one of the earliest and still one of the best works of the kind that has appeared in this country.

Page, Thomas Nelson (1853-), an American author. He was a native of Virginia and received his education at Washington and Lee University and at the University of Virginia. He studied law and practiced for a time, but, after his first volume of poems was published in 1883, he devoted himself to literature. These poems were in the negro dialect and the volume was entitled *Befo' de War.* Page's short stories are graceful, pathetic, and humorous. Among them *Marse Chan* and *Meh Lady* are best known. They are collected in a volume entitled *In Ole Virginia. Elsket* and *Red Rock* are longer stories that have won a deserved popularity.

Page, Walter Hines (1855-1918), a distinguished American editor and diplomat. He was born at Cary, N. C., and was educated at Randolph-Macon College and at Johns Hopkins University. Mr. Page, while engaged in teaching in Louisville, Ky., submitted an article to the *Atlantic Monthly.* It was accepted, and he then decided upon a literary career. Soon after, he became editor of the St. Joseph, Mo., *Daily Gazette,* and still later held a position with the New York *World.* Mr. Page was editor of the *Forum* from 1890 to 1895, and from the latter year until 1899 was literary advisor of Houghton, Miflin and Company, publishers. During 1896-99 he was also editor of the *Atlantic Monthly.* In 1899 Mr. Page assisted in establishing the publishing house of Doubleday, Page and Company, and from 1900 to 1913 edited its magazine, *The World's Work.* In 1913 President Wilson appointed Mr. Page ambassador to Great Britain. In 1914 he received from Oxford University the degree of Doctor of Civil Law. Mr. Page's editorials are marked by a clear insight into vexing economic and social conditions; and as an ambassador he discharged his duties in a creditable manner during a critical period in world history. He is the author of *The Rebuilding of Old Commonwealths.*

Page, Curtis Hidden (1870-), an American educator, was born at Greenwood, Mo., and received his higher education at Harvard Paris and Florence. He was professor of languages in many American universities, including Western Reserve, Harvard, Columbia, Northwestern and Dartmouth. As an editor he attained prominence with the *Pathfinder* and *Poet Lore.* As a translater he is responsible for the English versions of *A Voyage to the Moon,* by Cyrano de Bergerac; *Songs and Sonnets of Ronsard; The Best Plays of Molière* and *The Man Who Married a Dumb Wife,* by Anatole France. He also edited various collection of English and American masterpieces, including *British Poets of the Nineteenth Century; Rabelais* and *The Chief American Poets.*

Pageant, a dramatic spectacle usually given in the open. A pageant differs from the usual theatrical exhibition in that it does not center about a single plot. While the idea of the pageant is ancient, there has been a great revival of it in recent years, it being employed particularly to present a view of the life, customs, and events of the past. It has become a favorite method of celebrating an anniversary or some other important event in the life of a city or other institution. Such a pageant may confine itself closely to the historical development of that city or state. In such an instance the first scene might portray the early explorers, the French voyageurs or the Spanish invaders, costumes, and equipment, imitating as nearly as possible those of the original adventurers; the next scene would show the first settlements, the frontiersman with his ax, the log cabins, and the industries of the home, as spinning and weaving; in the next, there would be the war with the Indians, the sudden night attack, the futile struggle of the settlers, and the dragging away into captivity of the prisoners. In this way a graphic

story of the past would be printed upon the minds of the audience, many times more impressive than they could get from a printed page. In the other case historical scenes are also portrayed, but instead of limiting the display to that particular locality, any great period of history may be presented. The Elizabethan Age offers unexcelled opportunities along this line because of its picturesque character,—involving the quaint costumes, the varied classes, the magnificence of the court life, the severe asceticism of the puritans, and the strolling bands of players.

The educational value of the pageant is coming to be more and more recognized, especially by social settlement workers. It affords them an opportunity to teach patriotism in presenting pageants from the nation's history; to impress the ideas of law and order upon the participants; and at the same time to satisfy the natural dramatic instinct of the child and minister to his love of play.

Pageants on a less elaborate scale are within the possibility of any school or small community. The stage properties can be easily made at home. A campfire forms a sufficient setting for the Pocahontas scene, while Canton flannel can be utilized variously, either for Indian blankets, or with tufts of white sewed or painted upon it, for ermine robes. Khaki cloth is an excellent imitation of buckskin. The adoption of the idea of a historical pageant as a method of celebration would go far to solve the question of "a sane Fourth," and children would listen to the Declaration of Independence with interest if, in a pageant, they had been participants in the events leading up to it.

Pagoda, a common name for the Hindu and Buddhist temples of India, China, and other oriental countries. Often they are very splendid structures of wood and stone, gorgeously decorated. Some of them look as if nine or ten one-story buildings, each with a curved and widely projecting roof, had been placed one above the other, the pile narrowing somewhat toward the top.

Pain, a sensation, carried by a nerve to the brain, of injury done to some part of the body. Though varying from mere discomfort to intense agony, pain is essential as a means of calling attention to the need of movement. Were it not for pain, one might hold his hand in the fire until it was burned to a crisp without knowing it. The pain from an injury to a nerve in any part of its course seems to originate at the end. Soldiers whose limbs have been amputated say that irritation of the stump seems at first to give pain to their lost fingers or toes. See BRAIN.

Paine, pān, **Thomas** (1737-1809), the author of *The Rights of Man* and *The Age of Reason.* He was the son of a Quaker staymaker of Norfolk, England. He learned his father's trade, but tried his hand at various callings, including service as a marine, a collector of excise, a teacher of English, a Methodist preacher, and a debater of local political problems. He was a man of extreme views and vigorous expression, a strenuous advocate of the rights of the common people. "Where liberty is not, there is my country," said he. At the age of thirty-six, he crossed the Atlantic with the avowed purpose of stirring up the Americans to resist the tyrannical government of the mother country. He carried a letter of introduction to Benjamin Franklin. During the early stages of the Revolution, when the colonists had become discouraged, he issued a pamphlet called *Common Sense.* It appeared January 1, 1776, and is admitted by well informed writers to have been a turning point in the history of the struggle. Such was his zeal for the American cause that he served in Washington's army as a private soldier, and wrote political tracts by the flickering light of the campfire. In 1777 he was made secretary of the congressional committee on foreign affairs. He began immediately the publication of a series of appeals called *The Crisis.* In the first number appeared the memorable words, "These are the times that try men's souls." At the close of the Revolution, he received $3,000 from Congress and a grant of 300 acres of land in the state of New York by way of reward for his services.

When peace was restored America was too quiet for Paine. He sailed for Europe. At the outbreak of the French Revolution we find him occupying a seat in the national convention as representative of Calais. He

voted against the execution of Louis XVI, favoring instead imprisonment for life or banishment to the United States. In this way he lost popularity with the members of the Jacobin club; and, although he had been naturalized as a French citizen, he was turned out of his seat on the score that he was a foreigner. Imprisonment followed.

About this time he published his famous *Age of Reason,* an examination of the superstitions and theologies of the century. It reflected severely on many points of Christian belief and practice. It was, as may be imagined, severely censured by the clergy of the day. He was attacked as ignorant and atheistical. The work created a bitterness of feeling scarce possible at the present day. It alienated most of Paine's American friends. He returned to America in 1802. Washington, formerly an admirer, refused him an audience. Thomas Jefferson, however, walked the streets of the capital city with him arm in arm, "the Two Toms." At his death Paine was buried on his own farm. His remains were removed to England in 1819 by William Cobbett.

Paine was a man of versatile but of one-sided, partisan mind. In designing a bridge for the Schuylkill at Philadelphia, he insisted on the patriotic number of thirteen ribs. On the occasion of Washington's farewell address, Paine wrote these words in reply:

> And as to you, sir, treacherous in private friendship, and a hypocrite in private life, the world will be puzzled to decide whether you are an apostate or an impostor; whether you have abandoned good principles, or whether you ever had any."

Paint, pānt, a protective or decorative covering for wood, iron, and other surfaces. An outdoor paint consists essentially of a drying oil mixed with a pigment. The latter is a finely ground, earthy substance to give body and color. Both the oil and the mineral must be waterproof. They must be insoluble in water. For inside work protected from rain, the liquid may be water containing gum or a size made of glue. The oil used most frequently is linseed oil pressed from flax seed. It resists weather, it adheres to surfaces, and it dries out, forming a hard, finished surface,—the three important qualities. Bean oil, produced in Manchuria, is used in Japan as a substitute for linseed oil.

The same oil may be used for all colors, as color is given to paint by particles of mineral pigment held in the oil. It is interesting to know that paint has no color of its own. All are dark at night. All the colors of the rainbow are in the everyday white light of the sun. Each pigment has the faculty of absorbing all the colors but one. This one it reflects back to the eye of the observer. Thus a red barn in the landscape absorbs all the rays except the red; these it sends back to the eye.

Pigments made of lead, zinc, or gypsum (lime), reject nearly all the rays of light and turn them back to the observer. They make white paints. White lead is the most important of all pigments. It is used not only for white paints, but for the body of other paints, the desired color being secured by the addition of a small quantity of some intense pigment. Green paint is made usually by the addition of copper, arsenic, or chrome green. Green paint and green wall paper run a chance of being poisonous. A blue pigment of great beauty may be made from the mineral, lapis lazuli, but is too expensive. An artificial ultra marine, as it is called, is made by mixing together fine clay and salt, which are white, charcoal, which is black, and sulphur, which is yellow. It is used chiefly for inside decoration. Prussian blue is prepared from iron and copper. Cobalt gives an intense blue. Indigo is used as a dye in water colors, but it washes out of a paint and is not suitable for outside work.

Yellow paint usually contains ochre, a natural yellow clay. Its desirable qualities of freedom from grit, of weathering well, and of cheapness, are offset by a want of attractiveness. Chrome yellows are made by combining chromium with zinc or lead or barium. Red paint is the most common perhaps of all. Red pigments are usually lead tetroxide, that is to say, a red rust of lead; or else, and more commonly, a yellow ochre roasted in fire like a brick to bring out the trace of red-producing iron usually present. It is afterward crushed and ground to powder. Vermilion is a heavy,

brilliant pigment manufactured from mercury and sulphur. The Chinese make a vermilion paint of superior quality, the preparation of which they long kept secret. Brown pigments are chiefly ochre, containing considerable manganese. Black paint has a body of charcoal in some form, usually lampblack.

For inside woodwork, oil finish without a coloring pigment brings out the natural grain of the wood, and is much more artistic than paint, which hides the beauty of the wood. For outside work, paint is indispensable. Well painted buildings last longer and give an air of thrift and prosperity.

For about 2,000 years white lead, a basic carbonate of lead containing about 85 per cent of lead oxide and 15 per cent of carbon dioxide and water, was the only widely used white paint. The other white paints made their appearance less than a century ago, but white lead retains its popularity with the painter because of the ease with which it can be applied, and with the manufacturer because of its great covering power.

An old Dutch process still largely used for making white lead is as follows: Lead buckles or grids are placed upon supports inside specially constructed earthenware pots containing a quantity of acetic acid. The pots are then placed in stacks and surrounded by used tanbark. The slow fermentation of this bark, liberating carbon dioxide and heat, causes the acetic acid to volatilize and changes the lead acetate formed to the basic carbonate. It requires about 100 days to complete this process, after which the corroded material is ground in water, floated to separate it from the unchanged lead, and dried in copper pans. It may be sold either as a dry powder or ground in oil.

Several shorter processes for making white lead are based upon the same general chemical principles. Sometimes small particles of molten lead, obtained by spraying, are treated with acetic acid and corroded in revolving drums into which carbon dioxide is passed.

In recent years sublimed white lead has become important in the paint industry. It is obtained by subliming galena or lead sulphate, the commonest ore of lead, and contains about 75 per cent of lead sulphate, 20 per cent lead oxide, and 5 per cent zinc oxide. The discovery of zinc oxide as a paint was made about the middle of the nineteenth century. It is peculiarly adapted for mixing with other pigments, and the purest zinc oxides are selected as the standard of whiteness in paints. "The great competitor of white lead," according to a leading American authority on paints, "is zinc oxide, for the weakness of white lead is the strength of zinc oxide, and vice versa. White lead, for instance, is a soft drier and zinc oxide is a hard drier. White lead finally becomes powdery · zinc oxide in its eventual drying becomes hard, and it is for these reasons that a mixture of zinc oxide and white lead forms such a good combination."

Zinc oxide paints are much used to retard the rusting of iron, and also for enamels, on account of their gloss.

Black paints nearly all contain carbon as a base. Softwood, bones, ivory, cocoanut shells and various other vegetable and animal materials have been heated to form ingredients for black paints. Lampblack made by burning oily materials with an insufficient supply of air contains about 98 per cent of carbon. Carbon black may be made by burning gases in a similar manner and collecting the soot upon a rotating plate against which the flame strikes. Graphite is also much used as a basis for black paints, usually mixed with a considerable amount of lead or zinc compound.

Paints are thinned for use by means of a number of light, volatile liquids which dissolve oils. Of these turpentine was practically the only one used for many years. It is obtained by distillation of the sap of the long-leaf pine, which grows freely in the southeastern states, or by distillation of chips of the same wood, in which case it is known as wood turpentine. But there are now many substitutes for turpentine in use, including benzine, made by passing certain paraffin oils with wood turpentine over red-hot coke, and other mineral products, such as those obtained by the distillation of coal tar.

Up to fifty years ago each painter mixed his own colors, frequently ground by hand, with his white lead, at a great cost in labor and time, and the product was seldom uniform. Then the manufacture of prepared paints began, but at first these were not entirely successful. These conditions, however, soon changed, and with the introduction of laboratories under the supervision of trained chemists, the manufacture of prepared paints rapidly developed into an industry in which the processes were controlled by the application of scientific principles and in which the raw materials used were most carefully examined for their chemical purity and physical properties. Paints, stains, and varnishes for almost every possible use are now on the market in the most convenient form.

In 1920 the manufacture of paints in the United States occupied 601 factories, employing 17,485 wage-earners, and the value of their product for the year was $256,714,379. See Oil.

Painting, as a fine art, the making of pictures with color and brush.

Paintings are of two sorts, those in water colors, and those in oil. In the former the colors are mixed in water. Where the colors are opaque and conceal the surface entirely, the work is sometimes called distemper or fresco. This style of painting is much used for mural painting, that is to say, paintings on walls and ceilings. It is laid on the fresh, wet plaster and dries with it. It cannot be retouched. In drying, a film of carbonate of lime forms over the fresco and protects it. If it is desired to amend a painting of this sort, the plaster must be removed and a fresh surface prepared. Such a painting must be done with dispatch before the wall can dry. The great paintings on the ceiling and walls of the Italian churches are in fresco. Michelangelo's wonderful paintings in the Sistine chapel are frescoes.

Water colors are used much in painting flowers. The most delicate and natural tints are produced by this method. One of the greatest water-color collections of flowers in the world is displayed in Kew botanical gardens. It represents the life work of a Miss North and includes the pictures of thousands of rare and beautiful flowers. The materials needed for water-color work are simple. White paper and a box of water colors are easily obtained. Formerly an artist ground and mixed his own colors, but they are now supplied in small cakes in tiny pans ready for use. The best brush is made of sable's hair. The bristles are so carefully arranged that the brush tapers gradually from a shoulder to a point consisting of a single hair. Such a brush costs four or five dollars, but it takes the place of many inexpensive ones, and may be used to make the finest line or to produce a broad blotch of color.

Oil paintings are the most durable and are considered the most expressive of all pictures. The texture, that is to say the material, of which drapery, a face, or surroundings are composed, may be best expressed in oil. An oil painting seems more real than any other kind of picture. The great artists have ever endeavored to leave their best work in oil. Fragments of work done by the Greeks before the birth of Christ are said to be in existence. The earliest paintings were made on slabs of slate and of other stone, panels of wood, and plates of copper. Dark woods, like mahogany, are best for the purpose; but wood is apt to warp. Colors are apt to peel up and scale off when a metal or stone foundation is used.

The best foundation is a square of strong, heavy linen cloth called a canvas. It is stretched on a frame. To avoid the possibility of wrinkles in the canvas, this frame is made usually in such a way that a flat key may be driven into each corner to enlarge it slightly and take up the slack. Paints unite with canvas more perfectly than with any other material; and the canvas, being saturated with paint, is not subject to ordinary decay or destruction by old age.

Artists' colors or pigment are composed of various earths, minerals, and vegetable and animal substances. They are ground with care and put up in tubes. When at work the artist places his framed canvas on an easel, or he may fasten it, especially if large, to a wall. In his left hand he holds a thin, oval piece of wood called a palette, thrusting his left thumb through a hole made for the purpose. On the upper edge of this palette he squeezes but a few drops of several colors, especially white,

blue, red, yellow, brown, and black. From combinations of these he is able to obtain almost any shade or tint. For tools he uses a variety of brushes. A paint knife with a flat blade is sometimes called into play to lay color, and even the human thumb is not to be despised. In using the brush, most artists rest the arm on a slender rod. One end of this painter's stick rests on the easel or frame, the other is held in the left hand.

TWELVE GREAT PAINTINGS. The following are the twelve paintings which competent critics of many ages have cited as the world's greatest:

Assumption of the Virgin	Titian
Aurora	Guido Reni
Beatrice Cenci	Guido Reni
Communion of Saint Gerome	Domenichino
Descent From the Cross	Rubens
Descent From the Cross	Volterra
Holy Night	Correggio
Immaculate Conception	Murillo
Last Judgment	Michelangelo
Last Supper	Da Vinci
Sistine Madonna	Raphael
Transfiguration	Raphael

The painters listed here are treated individually under their respective names.

See also HALS, FRANS; BONHEUR, ROSE; VANDYKE, SIR ANTHONY; MILLET, JEAN FRANCOIS.

Painting in Mosaic. See MOSAIC.

Paisley, a manufacturing city of Scotland, noted formerly for the manufacture of fine shawls. These shawls were of the finest wool fabric starting with a plain center and developing into an elaborate pattern of many colors. Today they are valued highly by collectors. Paisley is in Renfrewshire County, on the White-Cart River, about six miles southwest of Glasgow. It lies on both banks of the river and the two sections are connected by three fine bridges. It is a very old city, dating back to the Roman invasion of Great Britain, so there are many quaint and interesting buildings. Some of these are the Abbey Church and the old prison. Some of the more recent structures are very handsome. Today the city is noted for the manufacture of textiles and allied commodities, particularly thread. The population is about 91,000.

Palanquin, păl-an-kēn′, a covered conveyance used for one person. The typical palanquin of India is a sort of litter long enough for a person to lie in at full length. It is roofed to shed rain and is surrounded by lattice work, like that of Venetian blinds, or by curtains. A pole projecting at each end enables it to be carried on the shoulders of from one to six porters, who swing off in step at a swift pace or even at a run. A set of men attend in order to change off. Before carriage roads were built and railroads introduced, this mode of conveyance was the main dependence of Europeans who

Palatine. See ROME.

Pale, in British history, that part of Ireland subject to English law. The parts of Ireland less completely dominated were said to be without the pale. They were subject to Irish law and to Irish customs. The English pale included Dublin, but the limits varied from time to time. The term came into use during the sixteenth century.

Paleontology, the science which deals with extinct life, that is, with the life that existed during past geologic ages. Fossils, often fragmentary and incomplete, furnish the materials from which such forms of life must be studied. That the subject of paleontology exists today as a distinct branch of research is due to an English engineer, William Smith, who toward the close of the eighteenth century made the observations which resulted in turning the attention of scientists to the study of fossils. While digging a canal across tilted strata in the south of England he noticed that certain kinds of marine shells in the lower strata were wholly different from the kinds found in the upper strata. These facts were definite and constant, the natural conclusion being that if he should find in other localities shells characteristic of one of the strata at the place where he was then at work, he would have a representative of that particular bed or deposit of marine shells, and that the stratum in which they were found might then be identified with the epoch during which these organisms lived. In the life of these past ages is found the basis for the classification of geologic time into the five great eras: Azoic, which means no

life, and is estimated roughly as lasting for about 10,000,000 years; Proterozoic, dawn of life, lasting about 18,000,000 years; Paleozoic, ancient life, called also the era of invertebrates, lasting 18,000,000 years; Mesozoic, middle life, or age of reptiles, lasting 7,000,000 years; and Cenozoic, recent life, or age of vertebrates, lasting 3,000,000 years.

From the beginning of the science of paleontology two directions in this research were apparent: one, that of the stratigrapher who studies the arrangement and succession of strata, and whose work is closely associated with that of the geologist; the other, the study of fossil organisms as forms of life is associated with the work of the zoölogist and the botanist. The stratigrapher is interested chiefly in fossils on account of their relation to the rocks in which they are found, and because through them he may obtain confirmation concerning the relative age of zones of rock deposits. But researches of the other class seek to learn of the beginnings of living forms and of their evolutions, and have been of great aid to the biologist in clearing up baffling questions of classification and in explaining the origin of various structures. This work falls naturally into two subdivisions: that of paleozoölogy, the study of extinct animals, and that of paleobotany, the study of extinct plants. A flood of light has been thus thrown upon problems of botany, the wide gaps between genera have been bridged over, and isolated genera and species have been accounted for. For instance, one of the botanist's unanswered queries had been why only one species of the tulip tree and one of sassafras was found. Paleontology teaches him that many species existed in former ages but that only one has survived to tell its story.

Paleozoic Era, the name of the great geologic era that extends from the Proterozoic to the Mesozoic eras. Included in this era are the Cambrian, Silurian, Devonian, Carboniferous and Permian periods (which see). The Paleozoic Era saw the development of life forms from the very simple to the extremely complex. See GEOLOGY.

Palestine, the land of the Israelites. Known also as Canaan, the Holy Land, and, in part, as Judea. The name signifies the land of the Philistines. It lies in southern Syria, between the Mediterranean and the Arabian Desert. The mountains of Lebanon are considered the northern boundary. The southern boundary is somewhat indefinite, but may be regarded as an arc, the keystone of which supports the Dead Sea. Area, about 9,000 square miles, equal to New Hampshire. The physical features are readily understood. The Lebanons send two parallel spurs southward. A coastal plain lies along the west, bordering on the Mediterranean. The river Jordan, the Sea of Galilee, and the Dead Sea occupy a long, deeply sunken basin between the ranges. The ranges reach a general elevation of 4,000 feet. Mount Hermon, the highest peak, is over 9,000 feet high. Other mountains of note in the Scriptures are Carmel, Tabor, Gilboa, Gilead, Nebo, or Pisgah, Zion, Moriah, and Olives. Although decidedly rough the country is naturally fertile. The prevailing rock is limestone, the disintegration of which supplies soil needing only careful husbandry to produce bountiful crops. There are many caves in the ledges, as the Cave of Machpelah at Hebron, in which Abraham buried Sarah; the Cave of Adullam, to which David retired, capable of sheltering 400 men; and others, many of enormous extent. The honey bee hives in the crevices of the rocks. The promise to the Israelites was "a land of hills and valleys, a land flowing with milk and honey." The Mediterranean coast is well tilled. The interior plain of the Jordan is robbed of moisture by the inclosing mountains and is nearly rainless. It is a mere barren waste of sand. The mountains are full of fountains, the most noted, perhaps, being the well of Bethlehem. Each has its history. Here Hagar sat, here Israel surprised the host of the Philistines, here Abram watered his flocks, and here Joab's messenger overtook Abner. Even Jacob's well is still here.

The mountains are still sparsely covered with forests. The cedar, ash, oak, olive, palm, walnut, sycamore, and oleander are the chief trees. There are between 1,000 and 2,000 native plants.

The population of the historic vales and mountain sides is now chiefly Arabic. There are also small colonies of Jews and Germans. Grain, olive oil, oranges, and wine are the chief exports. Jaffa, the leading seaport, is connected by rail with Jerusalem. In 1921 the population was estimated at 770,000, of whom 600,000 were Moslems, 80,000 were Jews and 84,500 were Christians. The population of Jerusalem is about 65,000, of Jaffa, 45,000, and of Haifa, 39,000.

In the time of David and Solomon Palestine was allotted to the various tribes of Israel. Reuben, Gad, and half of Manasseh resided on the east of the Jordan. Judah and Benjamin were located in the south. About 975 B. C. the kingdom of Israel was divided. The next event of importance was the captivity. The monarchs of Assyria carried the children of Israel away and replaced them by other people, Judah and Benjamin being the last to go, about 584 B. C. Palestine passed from the Assyrians to the Persians, then to the Macedonians. At the birth of Christ it was under Roman dominion. It then fell to the Eastern Empire and finally passed under Mohammedan control. With the exception of a short period during the Crusades, it was under Moslem rule since early in the sixteenth century, but was wrested from the Turks in the World War. After its conquest by the British, 1917-18, Palestine remained under military occupation until 1920. In that year the country was placed under British mandatory and the mandatory was approved by the League of Nations in 1922. Under civil administration Palestine has improved economically and intellectually, and further improvement is to be expected.

Palestrina, pä-lĕs-trīn′a, **Giovanni,** an Italian composer born in the early part of the sixteenth century at Palestrina, Italy. He died in 1594. After studying music in Rome he was given various important positions among the church musicians by Pope Julius III, being the first to bear the title of chapel-master. When Julius appointed a commission to recommend a reform in church music, which had been almost demoralized by irreverent composers, it fell to Palestrina to show that church music could be both dignified and artistic. He did so by composing three masses for six voices. So beautiful were they that Palestrina has been ranked ever since among the very greatest of musicians.

Paley, William (1743-1805), an English clergyman. He was born at Peterborough and was educated at Cambridge. After graduation he remained at his college for a number of years, holding a fellowship and acting as a tutor. After marriage he retired to Westmoreland in charge of a parish. Later he held a position in the cathedral of St. Paul's. In 1795 he was made subdean of Lincoln. He is remembered chiefly for a work entitled *Natural Theology, or Evidences of the Existence and Attributes of the Deity, Collected from the Appearances of Nature.* It is an argument in wonderfully clear and simple English for the divine creation of man. The author begins with the simple proposition that if one, wandering across a heath, were to pitch his foot against a stone, and were asked where the stone came from, he might reply that it had been there for all time for aught he knew. If one, however, were to find a watch with its wonderful mechanism of wheels, springs, and dials, and were asked the same question, he would reply at once that the watch had been made by an intelligent person and that it had found its way to the middle of the heath by some human agency. Paley then proceeds to point out the wonderful mechanism of the eye, likening it to an optical instrument, and the mechanism of the ear, with its delicate apparatus for receiving sound.

Palimpsest. See PARCHMENT.

Palindrome, păl′ĭn-dōrm, a word or sentence that reads the same from right to left or from left to right. Some famous palindromes are:

Adam's polite introduction of himself to Eve:

"Madam, I'm Adam."

Napoleon's vain regret:

"Able was I ere I saw Elba."

and John Taylor's confession:

"Lewd did I live and evil I did dwel."

It may be noted that *did, Eve,* and *ere* are word palindromes.

Palisades, the name applied to a line of steep, picturesque cliffs, extending for about 30 miles along the western shore of the Hudson River southward from a point a few miles above New York City; the southern end of the Palisades is at Weehawken, N. J. Throughout almost the entire course the cliffs rise sheer from the water to heights varying from 200 to 300 feet; they form a single escarpment that gives the effect of some particularly durable form of masonry and add greatly to the beauty of this part of the Hudson Valley.

In order to preserve some of this region in its original condition, 18,000 acres of the land on this part of the river have been set aside as a public playground under the name of Palisades Inter-State Park; this land is partly in New York and partly in New Jersey. The park is annually visited by thousands of people from the industrial centers nearby.

Palladium, a celebrated image of Pallas Athene. It was said to have fallen from heaven into the city of Troy, and the safety of the city was supposed to depend on the preservation of this image. During the siege of Troy, Ulysses and Diomed entered the city in disguise and stole the palladium, carrying it off to the Greek camp. The word palladium was applied also to any image of Pallas. The term palladium has passed into proverbial use and especially in the expression the "palladium of liberty."

Pallas. See ATHENE.

Pall Mall, pel mel, a famous street in London. It derives its name from the old French game of pail mail, introduced into England during the reign of Charles I, a forerunner of the modern croquet. The street leads westward from Waterloo Place. It is the center of London club life, and is a street of modern palaces.

Palm, päm, a large family, including 1,000 species of useful plants, chiefly tropical. Most palms are trees, some are dwarf in habit, and others again are creeping vines. A tuft of leaves at the end of the stem falls away as the stem rises or advances, giving the upright trees an arrowy stem, twenty to 150 feet in height. The stem is surmounted by a spreading crown of long, graceful leaves, attaining a size of thirty feet in length by four feet in width. The creeping stem of the rattan palm winds its way like a slender pumpkin vine over and through the jungle until the terminal tuft is, it is alleged, 600 feet from the root.

Various palms are discussed under separate titles. See RAFIA; RATTAN; SAGO; PALMETTO; DATE; COCOANUT.

Palm Beach, Fla., the most popular winter resort in the United States, is on the southeastern coast of Florida in Palm Beach County, 300 miles southeast of Jacksonville on the Florida East Coast Railroad. Palm Beach is on a long arm of land that is separated from the mainland by a body of water known as Lake Worth. This region has a mean winter temperature of 72°, which, with the fine beaches and sub-tropical vegetation, accounts for its popularity. It is becoming noted for its beautiful houses most of which are of an adapted Spanish type of architecture.

Winter tourists are accommodated in palatial hotels, of which the Royal Poinciana and Breakers are the largest. In 1920 the permanent population was given as 1,135, but this is swelled to not less than 5,000 each winter.

Palm Sunday, the Sunday next before Easter. It is so called in commemoration of Christ's triumphal entry into Jerusalem shortly before his crucifixion, when the multitude "spread their garments in the way, and others cut branches from the trees and spread them in the way."

Palma, Thomas Estrada (1835-1908), a Cuban statesman. He was born in Bayamo, Santiago de Cuba, was educated in Havana, and studied law in Spain. During the Cuban insurrection of 1868-78 he became a general but was later captured by the Spanish and his goods confiscated. Upon his release he returned to Honduras. Soon he went to the United States and established a school for Latin-Americans in Central Valley, New York. He was elected minister plenipotentiary of Cuba in 1895, at the time when a fresh revolt demanded his presence on the island. In 1901 he was made the first president of the republic, and was inaugurated on May 20,

1902. He was reëlected, but resigned in 1906, when a new insurrection broke out because the people distrusted the sagacity of his rule.

Palmer, Alice Freeman (1855-1900), an American educator. Alice Freeman was born at Colesville, New York, but her early life was spent in Windsor where she studied at a little academy. So meager was her preparation that when she applied for admission to the University of Michigan the examiners decided that they could not accept her. At the request of President Angell, however, who had talked with the young girl and had become convinced of her ability, it was decided to give her six weeks' trial, during which time she demonstrated that she could keep up with the class. She was graduated in 1876, taught in Ottawa, Illinois, and in East Saginaw, Michigan, and in 1879 was elected to the chair of history in Wellesley College. In 1880 she became acting president, and in 1882 president of that institution. In 1887 she resigned her position to become the wife of George Herbert Palmer, professor of philosophy at Harvard. She was for some years prominent in the Woman's Educational Association of Boston, and in 1892 was made non-resident dean of the women's department in the University of Chicago. Two years after going to Cambridge with her husband, she was made a member of the Massachusetts Board of Education, which position she retained until her death. She was active in Women's Clubs, in the Association of Collegiate Alumnae, in all work of whatever kind which tended to the education and uplifting of womankind. She died suddenly in Paris.

Mrs. Palmer's life was primarily a life of service. At a time when few colleges were open to women, and when such a thing as a woman's college with women only on its faculty was an experiment, she devoted all the energies of her keen mind, of her practical judgment, of her enthusiastic temperament to the furthering of this beloved cause, and scarcely did an individual meet her uninfluenced by her thought and aims. As a teacher she possessed all the qualifications which give power in the classroom; quick and responsive sympathy, absence of patronage, intellectual appreciation, optimistic faith, above all, the power to inspire in others the enthusiasm she herself felt for a subject. President Eliot of Harvard, speaking at the memorial service held for Mrs. Palmer, states that in his opinion her career is unmatched by that of any other American woman, except Dorothea Dix, whose work, however, along the line of relieving abuses in the care of criminals, paupers, and the insane, was less constructive and not so high in character as that of Mrs. Palmer. He adds that Alice Freeman Palmer is the "best example thus far set before American womankind."

Palmerston, päm-ẽr-stŭn, **Henry John Temple, Viscount** (1784-1865), an English statesman, born in Romsey, Hampshire. He studied at Edinburgh University, St. John's College, and was graduated from Cambridge in 1806. In 1807 he was elected Tory member of Parliament from Newtown, Isle of Wight; in 1811 he gained his seat from Cambridge and held it through a period of twenty years, losing it at the time when he lent his support to the reform bill. He regained it through Whig election from Bletchingley, South Hampshire, and Tiverton respectively, and represented the last of these, Tiverton, until his death. He was Secretary of War from 1809 to 1828 and during his term of office instituted varied reforms which brought order from the chaos in which he found the finances of the nation. In 1830 he became foreign secretary under Earl Grey, the Whig minister, and remained in that position until 1831, returning to it in 1846 under Lord Russell, the Whigs having again come into power. He was liberal in his views, and sympathized with the revolutionary forces in France to such an extent that inadvertently expressing himself in favor of the coup d'état of Louis Napoleon, he was forced to resign. In 1852 he was made home secretary, and prime minister in 1855. He resigned his premiership once, after his defeat on the Conspiracy Bill, but when he again came into power in 1859 he returned to remain until his death. Lord Palmerston was an ardent and patriotic politician, liberal, yet independent in his attitude at all times.

Palmetto, palm trees, chiefly of the West Indies, Florida, and the Carolinas. There are several species, but the name is restricted usually to the palmetto tree, twenty to eighty feet in height. Instead of a clean palm trunk, the first leaves break off a foot or two from the stem. Their adhering bases give the lower ten to twenty feet of the trunk a peculiar bristly, ragged appearance. The crown terminal bud of the palmetto is a substitute for cabbage. The leaves are cut for palm-leaf fans. The trunk is used for wharf piling on account of its ability to withstand the attacks of the dreaded teredo or borer. The trunks are used also in constructing temporary fortifications. A cannon ball buries itself harmlessly in the pithy, cork-like wood of the logs, without throwing splinters or dislodging them. Palmetto hats are made from the stripped leaves of another, the palmyra palm. South Carolina is called the Palmetto State.

Palmistry, the art or practice of reading character, discovering past events or foretelling the future by interpreting the lines and marks in the palm of the hand. It is called also chirosophy, two branches of the art being included in the term, chirognomy, which has to do with discovering the temperament and intellectual tendencies, and chiromancy, which aims to discover past and future events from the hand. Chiromancy is of ancient origin. It was known among the Egyptians, the Chaldeans, and the Hebrews. Aristotle and Plato regarded it with great respect. The Romans practiced the art and there is frequent reference to it in the writings of the Middle Ages. Later it fell into disrepute but again received some serious study in the nineteenth century, its revival being due to the work of two Frenchmen, Desbarrolles and d'Arpentigny.

Palmistry treats of the form of the hand and fingers, of the lines surrounding or partially surrounding the wrist, of the "mounts" at the base of the fingers and thumb, at the side of hand, opposite the thumb, and at the wrist, and of the lines on the mounts and on the palm. Both hands are studied, but the left hand is preferred as it is less affected by use. Of the lines four are important; the lines of life, the head, the heart, and fortune. According to the length and clearness of these lines the strength or weakness of the various tendencies is to be determined. It is believed by many that in chirognomy there is much of truth, that is, that the hand is to a great extent an index of character, but that chiromancy must be wholly fictitious. Others believe that those who claim to read the hand have, in reality, the power of mind-reading in a sufficient degree to give their sayings the semblance of truth.

Palmyra. See ZENOBIA.

Pamir, pä-mēr′, an elevated region of central Asia. It is the loftiest known plateau. The Persians called it the Roof of the World. The possessions of Great Britain, China, Russia, and Afghanistan meet in this region. Its boundaries are indefinite. It has a general elevation of 13,000 feet. It contains several small lakes and carries mountain peaks rising to a height of over 25,000 feet. The great portion is barren. The native Kirghiz pasture their flocks in its fields. It is traversed by two caravan routes from east to west.

Pampas, păm′paz, certain open grassy plains of South America. The term is synonymous with llanos. From the uplands of Patagonia they run northward through Argentina, embracing an area of 300,000 square miles. As a whole, the district is lacking in moisture for agricultural purposes, but is admirably adapted to grazing. Cattle and sheep live on the grasses the year around, without other feed or shelter. See STEPPE.

Pamphlet, an occasional, but not periodical publication, consisting of several leaves, unbound. The subject-matter deals generally with topics of current interest, and those which present political questions are often argumentative and controversial in nature. In English history both the religious and the political pamphlet have played an important role, especially during the reign of Queen Anne. Swift, the great pamphlet writer in English literature, made free use of this form of publication. So, too, did Defoe. Writers who indulge in invective consider this a satisfactory vehicle for spreading their views. Newspapers and magazines have gradually usurped the place formerly accorded to

United States Hospital in Panama

Street in Panama

IMPROVED CONDITIONS OF LIVING IN PANAMA

A Blast in the Canal

Steam Drills at Work in Bas Obispo Cut

DIGGING THE PANAMA CANAL

the pamphlet, and the need for it has of late become a fast disappearing one.

Pan, in Greek mythology, the god of pastures, forests, and flocks. He is represented in art as having the head and the shoulders of an elderly man with the hind parts of a goat. Sometimes the horns and ears of a goat adorn his head. He was the god of the shepherd, but he developed into a hunter and a fisherman. The word panic, as applied to a flock of sheep, has reference to Pan. The sudden fear which sometimes overtakes an army was attributed by the ancients to Pan's influence. He was fond of music and was wont to dance with the forest nymphs. He is credited with the invention of the shepherd's flute, whence the expression Pan's Pipes. He taught Apollo to play on them.

Panama, păn-a-mä′, a republic of Central America. It was formerly a department of the republic of Colombia. A treaty for a canal across the isthmus having been rejected by the Colombian Senate, the province of Panama asserted its independence November 3, 1903. A provisional government set up by the people was at once recognized by the United States, and notice was issued that Colombian troops would not be permitted to land or to interfere with the new government. The European powers, recognizing that the building of a canal was in the interests of civilization, recognized the new republic promptly. Panama is about 480 miles long. The breadth varies from thirty-seven to 110 miles. The total area is 32,380 square miles. The estimated population is 401,450. comprising Spanish, Indian, and Negro elements, with a few temporary occupants from the United States, Germany, France, and other European countries. Panama, on the Pacific coast, is the chief city. It has a population of about 60,500 and has been made the capital. The corresponding port on the Atlantic side is Colon, or Aspinwall, with a population of 26,000. A railroad crosses the Isthmus from Colon to Panama. The soil of the new republic is unusually fertile. The rainfall is heavy. The forest growth is luxuriant. About half of the country is occupied. A very small proportion indeed is under proper cultivation. Bananas are the most important product. One company, composed of Americans, exports $2,000,000 worth annually. About 130 tons of caoutchouc is collected on the mountains each year and brought to market by the Indians. There are rubber plantations near the coast also. Coffee, cocoa, Brazil nuts, mahogany, sarsaparilla, and ipecac are exported. Cattle, horses, pigs, and goats are raised on the uplands. There are pearl fisheries in the Gulf of Panama. Mother of pearl to the value of $75,000 a year is obtained. Turtle shell, used in manufacturing combs, is abundant.

Panama Canal, a ship canal across the Isthmus of Panama. It was completed in 1914 from Colon on the Caribbean Sea to Panama on the bay of that name on the Pacific coast. Owing to the crookedness of the isthmus the Pacific end of the canal is farther east than the Atlantic end. The construction of this canal has been under consideration for nearly a century. The gold discoveries of 1849 led to the building of a railway near the proposed route. In 1876 a French commission surveyed the isthmus. Three years later a French company organized by De Lesseps received permission from Colombia to build the canal. The company sold stock to the French public and expended many millions in the purchase of machinery and in actual work of construction. Charges of wasted money and peculation led to an investigation of the affairs of the company and to the suspension of work.

Early in 1903 the canal property of the French company was offered to the United States government for $40,000,000, and the offer was accepted February 16, On November 3 of the same year the Republic of Panama, formerly a department of Colombia, declared its independence, and was promptly recognized by President Roosevelt. It occupies the entire isthmus of the name connecting North and South America, lying between the Caribbean Sea on the north and the Pacific on the south. By a treaty signed November 18, 1903, ratified February 23, 1904, and with a supplemental agreement negotiated by William H. Taft, then secretary of state, later in 1904, the United States acquired the right to construct the Panama Canal across the isthmus; also the Canal Zone, a strip ex-

tending for five miles on each side of the Canal, the terminal cities of Cristobal adjacent to Colon, and Balboa adjacent to Panama, with islands for defensive purposes in the bay, in perpetuity and exclusive control for police, judicial, sanitary, and other purposes. The treaty also gave the United States complete jurisdiction over sanitary and quarantine matters in the two cities of Colon and Panama; and it owns and operates the Panama Railroad, 47 miles long, connecting these cities. By way of compensation for these rights, the United States agreed to pay the Republic of Panama a lump sum of $10,000,000 and $250,000 a year, beginning after nine years.

Active work on the construction of the Canal was begun by Americans May 4, 1904, and completed under Colonel George W. Goethals, chief engineer, in 1914, being opened to general traffic on August 15 of that year.

The Canal was built across the isthmus at its narrowest part but one. The saddle through which it crosses the continental divide was originally about 335 feet above sea level. Gold Hill, the highest point immediately alongside the channel of the Canal, rises 540 feet above sea level. The Canal has a length of 43.8 nautical miles from deep water in the Atlanic to deep water in the Pacific. It extends at sea level from its starting point in Limon Bay to Gatun, 5.7 miles; and at Gatun the sea level section ends in a flight of three pairs of locks, forming the steps to Gatun Lake, which has a normal elevation of 85 feet above sea level.

Gatun Lake was formed by damming the Chagres River, and its excess water passes through a spillway to the sea along the old course of the lower Chagres. From Gatun Lake the Canal passes up the valley of the Chagres to Gamboa, 20.55 miles, and in this section comparatively little excavation was required of the Canal builders. But at Gamboa the real difficulties of the great undertaking were encountered, in driving through the continental divide with the famous Culebra Cut, in which numerous landslides hampered the work from time to time, and still occasionally occur. The cut is 6.97 nautical miles in length, with a bottom width of 300 feet, and extends to Perdo Miguel lock and dam, on the Pacific slope of the divide. Here a single lock lowers the traffic to Miraflores Lake, a small body of water about a mile long, its surface waters being 55 feet above sea level. Miraflores locks are situated at the south end of this lake, and lower vessels in two steps to the Pacific, after which a sea-level channel 7 miles in length carries them past Balboa and out into the ocean.

The Panama Canal channel has a minimum depth of 41 feet, and in parts of Gatun Lake the channel is about 80 feet deep. There are 12 locks in pairs, each having a usable length of 1,000 feet and a width of 110 feet, giving ample room to handle the largest ships yet built. Gatun Dam, by which Gatun Lake was formed, is an immense, gently sloping mound, built by pumping sand and clay into the space between two ridges of rock and earth. It is 1.5 miles long and one-half mile wide at its base; its crest is 105 feet above sea level and the width of the dam at the top is 100 feet.

The time occupied in transit through the Canal is from 10 to 12 hours, including three hours for passage through the locks. In the construction of the Canal 5,000,000 cubic yards of concrete were required. There were 2,150 buildings of various sizes acquired from the French, of which 1,537 were utilized by the American engineers. The French had excavated 108,000,000 cubic yards of earth and rock, and after construction was resumed by the United States 250,000,000 cubic yards additional were excavated. The average force employed in construction work numbered about 39,000, and the total cost of the Canal to the United States was approximately $375,000,000.

In the fiscal year 1922 the number of vessels passing through the Canal was 2,736, of which 1,095 were American, 935 British, and 189 Japanese. The gross tonnage of these vessels was 14,361,083, and the Canal tolls collected amounted to $11,197,822 for the year.

President Harding recommended to

The gate at the first Gatun Lock swings open and the ship from the Atlantic enters. (See Bird's-Eye View on opposite page.)

The gate is closed by electric power, water pours into the first chamber and the ship rises with the water level.

We pause at Gatun to inspect an emergency dam to be used if an accident befalls the gates.

Culebra Cut is reached after the ship has steamed at full speed through Gatun Lake.

Congress on September 5, 1922, the negotiation of a new treaty with the Republic of Panama, to supersede the 1903 treaty with the Taft agreement under which the Canal was constructed. The Panama government was anxious to have made more clear certain provisions of the treaty regarding the right of the United States government to intervene in behalf of peace and order in Panama, etc.

Under a treaty made in 1921 between the Republic of Colombia and the United States adjusting the loss caused by the secession of Panama in 1903, Colombia is to receive in compensation $25,000,000 from the United States, in yearly installments of $5,000,000.

The Canal Zone is a military reservation, administered by the War Department, and no private individuals are permitted to acquire land within its limits. The civil population of the Zone on June 30, 1921, numbered 23,757, of whom 8,158 were Americans. The Panama Canal and Panama Railroad employes included 2,825 American men and 323 American women; other employes numbered 5,168, principally West Indian Negroes. Government headquarters are situated at Balboa Heights.

Electric power is used to operate the locks of the Canal, and electric locomotives running on tracks on each side tow vessels through the locks. The line of the Panama Rairoad is located on the eastern side of the Canal.

The Canal Zone has been fortified for defensive purposes under the direction of the Chief of Engineers, U. S. A., and forts and batteries mounted with long-range guns are manned by garrisons of coast artillery. A mobile army force of infantry and other troops is also stationed on the Zone.

An achievement of great importance in connection with the building of the Canal was the stamping out of yellow fever and malaria by the army medical corps, under the capable direction of the late Surgeon-General W. C. Gorgas. From a sanitary standpoint the Zone is today a safe and healthful place for white residents.

As an engineering feat, the construction of the Panama Canal takes high rank. It is the third longest canal in the world, and was by far the most difficult to build. Its value to the United States, by affording a convenient and comparatively short route for passage between the Atlantic and Pacific coasts cannot be estimated in money, and it possesses an international influence for peace. It has brought the eastern and western ports of the United States and Canada thousands of miles nearer to each other; has similarly cut down the distance between the Atlantic ports of the United States and the Pacific ports of South America, and brought New York nearer than London and Liverpool to Australia and the Orient. The present generation has thus seen the dream of DeLesseps developed into an accomplished fact by the energy and enterprise of an American President and the genius of American engineers.

Pan-American Congress, a conference of delegates from all the governments of South and Central America. The first congress was held in Washington, D. C., in 1889-90. The object of this conference was to further and improve the existing international relations between the countries represented. Recommendations were offered for the establishment of a uniform system of weights and measures, an international bank, uniform commercial coinage, common trade and customs regulations, and many other important suggestions were offered which would, if embodied in treaties, carry out the original aim of the assembly.

The second Congress assembled in Mexico City, October 22, 1901. Delegations from nineteen states were present. The purpose was similar to that of the first Congress. The following additional recommendations were offered: That a line of railway connecting North and South America be constructed, and that uniform quarantine regulations be established.

The third Congress was held in Rio de Janeiro, Brazil, July and August, 1906. The chief event of this Congress was the discussion of the Drago or Calva Doctrine providing that no debts due Europe by citizens or countries of South America can be collected by force. This matter was submitted to the Hague Tribunal.

The fourth Congress was held in Buenos Ayres, beginning in July, 1910. The name International Bureau of American Republics was changed to Pan-American Union. An attempt was made to have all the states bind themselves to submit to arbitration all claims for damages that may be presented by their respective citizens and that cannot be settled through diplomacy.

The fifth Congress met in Washington in 1915 to discuss difficulties arising from the Great War and to devise means for overcoming these difficulties.

Pan-American Exposition, an exposition held in Buffalo, New York, from May 1 to November 1, 1901. The purpose of the fair was the exhibition of the products of the Americas. The area of ground covered was 350 acres, the total cost of the exposition was $8,860,750.20. The total receipts amounted to $5,478,589.37. This financial loss was due to a certain extent to the assassination of President McKinley, for at the time of this terrible tragedy the fair was temporarily closed. The architecture of the buildings attracted attention, most of them being typical of buildings found in the South American countries. The chief feature of the exposition was the magnificent electrical display which was made possible by obtaining power from Niagara Falls. Over 5,000 horsepower was used, and thousands of incandescent lamps illuminated the grounds. The electric tower was 409 feet in height. The stadium, from which the athletic contests could be viewed, seated 10,000 people.

Pan-American Union, an international organization, with headquarters in Washington, D. C., maintained by the twenty-one American republics, including Argentina, Bolivia, Brazil, Chili, Colombia, Costa Pica, Cuba, Dominican Republic, Ecuador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Salvador, United States, Uruguay and Venezuela. It was established in 1890 upon the recommendation of the first Pan-American Conference, for the purpose of maintaining closer relations between the republics of the western hemisphere. Its duties have been broadened since then, and it is now a general clearing-house of information concerning the nations of North, South and Central America.

Broadly speaking, the Pan-American Union is said to be "devoted to the development and advancement of commerce, friendly intercourse, and good understanding" among these countries. It is supported by quotas contributed by each member country, based upon its population. Its affairs are administered by a director-general and assistant director, elected by and responsible to a governing board, which is composed of the Secretary of State of the United States and the diplomatic representatives in Washington of the other American governments. The two executive officers are assisted by a staff of experts in international affairs, statisticians, commercial specialists, editors, translators, compilers, librarians, clerks and stenographers. The Union publishes a monthly bulletin in English, Spanish and Portuguese, which is a record of Pan-American progress, giving the latest official data concerning the resources, commerce, and other features of the republics. It also publishes numerous special reports and pamphlets on various subjects of practical information.

The Union occupies as its headquarters a fine building at the corner of 17th Street and Potomac Park in Washington. This structure was erected and equipped with funds furnished by Andrew Carnegie, and contributions from the member republics. It was dedicated April 26, 1910. The library of the Union, called the Columbus Memorial Library, contains 50,000 volumes, 25,000 photographs, 180,000 index cards, and a collection of 1,600 maps. The first director-general of the Union was John Barrett.

Efforts to bring about closer relations between the nations of North and South America have been made from time to time for a hundred years, with varying results. The first congress of delegates representing these nations met at Panama in June, 1826, "for the consideration of questions of common interest." Nothing definite came of this congress, but in 1847 a conference representing five South American republics was held at Lima, Peru, and resulted in

treaties of confederation and of commerce and navigation, a consular convention, and a postal treaty. In 1864 a conference representing seven South American republics and one Central American state was held at Lima to form a Latin-American Union, but without practical result. In 1878 a third conference was held at Lima, with representatives from seven South American states and the island of Cuba, resulting in treaties of international law and extradition, which however were ratified only by Guatemala and Paraguay.

Then came, in 1889, the first Pan-American Conference at Washington, under the presidency of James G. Blaine, as Secretary of State. Every American republic except Santo Domingo was represented, and to April, 1890, a number of recommendaafter sessions lasting from October, 1889, to April, 1890, a number of recommendations were made, few of which were adopted. The second Pan-American Conference met in the City of Mexico in October, 1901, and some advance was made. Again in 1906 representatives of all the nations concerned, except Venezuela and Haiti, met at Rio de Janeiro for the third Pan-American Conference, and discussed international arbitration and other subjects, which were referred to the Hague Conference for decision. The Bureau of American Republics, established in 1890, was reorganized as the Pan-American Union, and considerable advance toward a better understanding resulted. A fourth Pan-American Conference was held at Buenos Aires in 1910, and the fifth assembled at Santiago de Chile in 1923, with all the republics represented except Mexico, Bolivia and Peru. The United States had seven representatives at this conference. Mexico refused to attend because the Obregon government had not then been recognized by the United States. Peru and Bolivia were absent on account of temporary trouble with their neighbors.

Canada is not a member of the Pan-American Union, although as a self-governing dominion of the British Empire she is practically as much of a republic as the United States.

Latin-America, through the efforts of the Pan-American Union and other agencies, has been growing to realize the friendly attitude of the United States toward the other American republics, and this attitude has been impressed upon them by successive governments at Washington and able Secretaries of State, including Elihu Root, William H. Taft, William J. Bryan and Charles E. Hughes.

As indicating the dependence of the United States upon the other republics of the Western Hemisphere, the Institute for Public Service said in 1923:

"Cuba is our sugar-bowl, Central America our chewing-gum tree, Mexico and Central America our colored-candy bag, Mexico our oil well and cattle ranch, Argentina our wheatfield and cattle range, Brazil our coffee and rubber plantation, Venezuela our asphalt bed, Chile our fertilizer field and Bolivia our tin mine."

Pandora, in Greek mythology, the first woman. She is the Eve of the ancients. According to one account she was made by Jupiter and sent to Prometheus and his brother Epimetheus to punish them for stealing fire from heaven. No pains were spared to make her perfect. Every god contributed. Venus gave her beauty; Mercury, the art of persuasion; Apollo gave her the gift of music. Prometheus was somewhat cautious about accepting a woman, but his brother was delighted to take the chances. The latter had a number of articles in a jar which he cautioned Pandora not to open. Pandora, however, could not restrain her curiosity. One day, when quite alone, she lifted the cover and peeped in. Out flew a number of plagues of man, such as colic, gout, and rheumatism for his body; envy, spite, and revenge for his mind. Pandora replaced the lid quietly, but everything had escaped save hope. Hope still remains to this day to comfort mortals in the midst of their distress. A more common version of the legend runs to the effect that, on her wedding day, Jupiter gave Pandora a box in which each god had inclosed a blessing. Pandora, being filled with curiosity, opened the box incautionsly and permitted the escape of all the blessings save hope. Reference to Pandora's box is frequent in literature.

Asiatic panther.
Asiatic irbis.

Jaguar, South America.
Leopard, Africa.

THE PANTHER AND RELATIVES.

Pangolin, a peculiar digging animal. The family is related to that of the armadillo, the anteater, and the sloth. There are several species, extending from China and Borneo to South Africa. The largest is an African species six feet in length, known as the giant pangolin. The best known species is the common pangolin of Ceylon and India. It lives in the lowland jungles. A mature specimen is about thirty-six inches in length, including the tail. The weight is eighteen pounds. From the tip of the nose to the end of the tail it is covered with flat, shield-shaped plates or scales of clear gray horn. The scales lie close upon the skin and are arranged to break joints like the scales of a fish. The tail is about five and one-half inches wide where it joins the body. In fact, body and tail are continuous, like the body of a lizard. In walking the pangolin carries his back highly arched at the middle. The tail barely clears the ground. When alarmed the animal ducks its nose between its front feet, brings its flat tail forward over its feet and face, and coils up quickly like a snail, presenting a perfect armor to the outside world. The muscles of the tail are so stout that even two men cannot straighten out the coil. Like other adentata the pangolin is toothless. It has powerful claws for digging. It lives chiefly on ants. It digs open the anthills and gathers up the ants with a long, slender tongue. See ANTEATER; SLOTH.

Pansy, an enlarged, improved violet. The name is French, signifying a thought, as though a pansy had the power of thinking when one looks into its charming face. The old English name is heart's-ease, suggestive of a comforting sympathy with one's thoughts. Gerard, a botanist of the sixteenth century, says of the "pansie," its "colours—purple, blew, and yellow—are so excellently and orderly placed that they bring great delight to the beholders." See VIOLET.

Pantheism. See THEISM.

Pantheon, a famous temple of ancient Rome. It is the largest inclosed building of antiquity. It is a trifle larger than the dome of St. Peter's. It was erected by Agrippa about 25 B. C. It was dedicated to all the gods, as the name signifies. The building is circular in shape. The base is 182 feet in diameter. The interior space is hemispherical. It is covered by a dome of circular masonry 142 feet in span, said to be the largest unsupported cupola known in architecture. The top is 141 feet above the pavement. Light is admitted by openings at the apex only. To carry so heavy a dome the walls are of unusual thickness. They contain a number of chapels within themselves. The Pantheon was used as a place of Christian worship for many centuries. It is still standing in a state of excellent preservation.

Panther. See COUGAR. The panther of Old World literature is the leopard.

Pantomime. See HARLEQUIN.

Papacy, a term applied to the ecclesiastical system in the Roman Church and also to the papal influence as exercised politically throughout the centuries. The claim of the papacy to ecclesiastical supremacy rests on the idea of apostolic succession. It is generally acknowledged that the Church at Rome was founded by St. Peter and thus became the only Apostolic See in the West. Though other apostolic sees were established in the East, they early disappeared leaving the one at Rome important not only because it was founded by an Apostle, but particularly so because founded by Peter, chief of the Apostles. As the Church at Rome grew, so the power and authority of the bishops at Rome, his successors, increased,—no other church being able to claim an unbroken chain of succession back to an Apostle.

As the Church was the only civilizing and intellectual influence in the West during the Dark Ages, it became increasingly natural to refer moral and spiritual, and, ultimately, political questions, to the Pope for arbitration. At first the popes claimed only spiritual authority, but Gregory VII, upon his accession in 1048, claimed more power than had his predecessors. He plainly asserted the supremacy of the spiritual over the temporal, but his ideas were not continued in their entirety by his successors. It was not till the reigns of Boniface VIII (1294-1303), and John XXII (1316-1334), that these ideas again found expression. After the Reformation, the Church had less opportunity to assert

its claim to right of arbitration, but the popes never abandoned their position. Even in the times of the greatest exercise of papal power, the reign of Innocent III, the power of the popes to act as arbiters depended largely on the consent of the temporal rulers. It is the present hope of the Church that in the future the Papacy, as the greatest Christian force in modern times, may come to exercise a more potent influence in the interests of peace.

As a temporal power, the Papacy dates its authority back to the early Middle Ages. The Church of Rome early acquired property. The catacombs near Rome belonged to the Church. The Emperor Constantine permitted the wealthy to leave their homes and lands to the bishop of Rome. In this way a large amount of territory came into possession of the pope in Italy and elsewhere, in the capacity of an owner, but not as a ruler. In the chaotic condition that prevailed, there are accounts of almost endless strife between the pope and the petty princes of Italy concerning the papal possessions. In 754 Pepin, king of the Franks, made Pope Stephen II ruler, that is to say, king, of twenty-two cities, chiefly in Lombardy. This was the beginning of the publicly acknowledged civil rule of the pope.

Henceforth the patrimony of St. Peter, known variously as the Papal Dominion and the Papal States, was recognized as an independent state, and the pope as a civil ruler. Territory was added from time to time. Toward the close of the seventeenth century the papal territory attained its greatest extent. Napoleon began the work of reduction in 1797. After various encroachments and restorations, in which jealous neighbors bore a part, the last territory of the pope, including the Eternal City itself, passed under the rule of Victor Emmanuel, king of Italy, December 20, 1870, and the last trace of temporal power disappeared.

In 1871, by way of respect, the Italian government granted the Vatican, the present papal residence, the Lateran, the former papal residence, and the papal villa, a summer residence, what are known as extra-territorial rights. In this respect, the privileges of the papal court are similar to those of a foreign embassy. The home and offices of the Pope are not subject to police or other government surveillance. The Pope maintains his own government wholly independent of the Italian. Diplomatic agents are accredited to him by many of the nations, just as they are to the Italian government. The United States, not recognizing any religious sect, is not represented at the Vatican. The Italian government expressly renounces any authority over persons connected with the papal establishment.

In 1870 Pope Pius IX enunciated the doctrine of papal infallibility, declaring that in all matters affecting faith and morals the Pope's word was final and authoritative. A small proportion of Catholics, particularly in Germany, refused to accept this dictum. This party is known as the Old Catholics, but while they form a considerable body, they do not constitute a menace to the unity of the Church.

Papal Bull. See BULL.

Papal States, the portion of central Italy which, before the unification of the kingdom, was under the temporal power of the Pope. These dominions of the Pope had their origin in the grant of a few districts which Pepin, king of the Franks, bestowed on Stephen II in 754. Before 1859 the Holy See possessed 17,218 square miles of territory, with a population of 3,124,668. The Austro-Italian War reduced the area to 4,891 square miles, and the population to 692,106. In 1870 the possessions formerly under control of the church were annexed to the territory of Victor Emmanuel, king of Italy, who invaded Rome and established his power by sheer force of arms. On September 20, Victor Emmanuel declared Rome the capital of Italy, and with that the temporal power of the Pope ceased, except for his palace, the Vatican, the possession of which was guaranteed to him. See PAPACY.

Papaw, a small tree or shrub of eastern North America. There are eight species in the United States, two of which are in cultivation for their large, showy spring flowers and handsome foliage. The common Indian papaw is a small tree noted for fleshy berries from two to six inches long. This papaw grows native from Kansas to

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PIUS XI

Showing the Papal Throne, the Pontifical Vestments and the Fisherman's Ring.

New York and southward. The fruit has a rich brown color. It has a highly aromatic flavor. The seed is large. It has been suggested that the papaw is capable of development into an important American fruit. The papaw of the tropics, quite another thing, is the fruit of a species of palm. This fruit has a shape, color, and length that has gained for it the name of false banana.

Paper, a thin, flexible sheet of compacted vegetable fiber such as is used ordinarily for writing, printing, and various other purposes. The gray material with which the wasp builds a nest is genuine paper. An ingenious boy can make paper by grinding a piece of spruce or poplar on a wet grindstone until a handful of fiber has been collected. Boil this fiber for two or three hours; pound it with a hammer until it is fine; then throw a little of it in a kettle of hot water and let it settle until the floating fiber forms a film. The film may be lifted off by means of a sieve or a piece of wire cloth. Place the film between two pieces of blotting paper and run it through a clothes wringer. If the operation is a success the fine fibers of the wood will felt, forming a sheet of coarse paper.

The process thus described is essentially the plan followed in the four thousand or more paper mills of the world. It has been found that almost any vegetable fiber made fine enough will felt and form paper. Cotton, jute, hemp, flax, Spanish esparto grass, straw, and various woods are used. After cotton cloth has been worn out for clothing, the rags still make good paper. The finest writing papers are made from linen.

The newspapers of North America and northern Europe are printed chiefly on paper made from wood pulp. Spruce and poplar are the favorite woods. Timber is cut into sticks or blocks, usually about two feet in length. The sticks are stripped of bark by means of a sharp blade, managed much after the manner of a turning lathe. Knots and imperfections are cut out, usually with an axe. The blocks are converted into pulp by means of a grindstone set in a steel case. A current of water prevents the wood from charring and carries away the fiber as fast as it is torn off. The escaping pulp lodges on a wire sieve through which the water drains off. As fast as the pulp accumulates, it is rolled up into bundles of about twenty-five or fifty pounds.

A separate supply of pulp is made by a chemical process. Chips are boiled in a solution of sulphurous acid until they are disintegrated. The two kinds of pulp are mixed together in an immense churn or beater in the proportion of about three parts of ground pulp to one of sulphite pulp. To each thousand pounds of pulp, the expert adds some rosin, or similar material, just enough to give the slightest degree of stickiness, and some aniline blue such as the housewife puts into her wash water to make her clothes white. The mass is then churned by powerful machinery and pressed through knives until the fiber is so fine and short as to be hardly recognizable. In this condition, it is mixed with water and passes into a long vat, the longer the better. The content of the vat has the appearance of milky water. An endless sieve or apron, running on bearings, gathers a film of the fiber and carries it out of the vat to a series of rollers. An endless web of paper leaves the apron and passes through almost numberless pairs of rollers. It is compacted, pressed, dried, and polished; and is wound up finally at the far end of a long building in a roll ready for the power press of the newspaper office.

A roll of this sort weighing 4,000 pounds was exhibited at the Buffalo Exposition. It was a continuous sheet of paper, 152 inches wide and six miles in length. A machine manufactured in Edinburgh in 1905 for a Swedish paper mill was designed to produce a continuous web of paper 150 inches wide at a rate of 500 feet per minute.

For small newspaper offices the web of paper is cut into sheets as fast as it comes from the paper-making machines. There are many details relating to the use of chemicals, sizing, the use of clay to fill up the texture of the paper, tinting, water marking, and many devices for cleaning and pulping rags and old rope, which it is unnecessary to describe here. Handmade paper is made in the same way, except that the web is lifted from the vat in small sheets and manipulated by hand. The

finest grades are handmade. Tissue paper requires greater skill and care, of course, than wrapping paper, but the processes are practically the same. The paper of which United States currency is made comes from a mill at Pittsfield, Massachusetts. Fine silk threads are mixed in the pulp to give strength and prevent counterfeiting.

So far as known, the first people to make paper by grinding up vegetable matter into a pulp and then spreading it on water to form a sheet were the Chinese. This method was in vogue among them two or three centuries at least before Christ. Strangely enough, they have not improved their methods. The printing paper still used by the Chinese court for its official bulletin is very crude indeed. A fine quality of oriental paper is made from the bamboo. It is believed that paper making was brought into the western world by the Saracens. They established a famous paper mill at Damascus. The first paper mill in Europe was built by them in Spain. Paper making began in France about 1189; in Germany about 1380. The English pride themselves on paper made as early as 1330. The first paper mill in the New World was built by William Rittenhouse. It was erected in 1690 at Germantown, now a suburb of Philadelphia. Egypt, the home of the papyrus which gives its name to paper, has no paper mills. The United States, one of the youngest of nations, makes one-half of the world's paper.

Paper pulp is used in the manufacture of car wheels, binder bolts, paper boxes, carpet lining, pressed buckets, tubs, bricks for paving, roofing tile, blackboards, and boards. Telegraph poles made of rolled sheets of paper are light and last well. The Japanese make clothing, parasols, window frames, lanterns, handkerchiefs, and sandals of paper. The Germans make pressed paper barrels, boxes, vases, and milk bottles.

So far as the consumption of paper is an index of enlightenment, Canada leads the world. The consumption stated in pounds per person, all kinds of paper counted, is approximately:

Country.	Lbs. per Person.
Canada	62.7
United Kingdom	55.0
Sweden	52.8
United States	49.5
Germany	43.4
Norway	37.2
Switzerland	33.0
France	30.8
Austria-Hungary	24.2
Belgium	24.2
Europe, average	22.0

MANUFACTURE. Until the end of the eighteenth century paper was made by tearing and beating rags to pulp in a machine, dipping a wire sieve into the pulp, transferring the mass to a felt, and pressing it in molds of various sizes. About 1800 a Frenchman devised a method of making it in a continuous web, which he introduced into England, where it was steadily improved, as also in the United States, until about 1860, by which time for all ordinary purposes, it had superseded the old hand-made method, although the latter is still employed for banknotes, bonds, ledgers and important documents.

With the introduction of machine-made papers, the output vastly increased, the cost was reduced, and the variety extended to such a degree that there are now probably more than 20,000 kinds of paper manufactured. In 1820 the machines produced paper at the rate of about 40 feet per minute; the most modern machines now exceed 500 feet per minute. The use of esparto, a grass also employed for making mats, nets, baskets, etc., was introduced in England about 1860, and the consumption of esparto in that country for paper-making is now about 200,000 tons a year. Over 400 different materials have been tried in the paper industry, but rags and esparto are the chief for good papers. The use of chemical wood pulp as the material for middling and cheaper kinds of paper dates from about 1880, and more recently mechanical wood pulp—made by crushing wood between rollers or by pressing it against a grindstone—mixed with varying quantities of chemical wood pulp, has been employed for the cheapest newsprint and common printing.

Science has played an important part in the development of the paper industry. The introduction of cheap bleaching agents, such as chloride of lime, has effected con-

siderable improvement and economies, while the utilization of wood pulp, esparto, straw, etc., has been made practicable only by scientific research, resulting in the modern processes of paper-making.

In making rag paper by machinery according to the modern method, the rags are boiled with caustic soda, which separates the cellulose fibers, then placed in a machine called a breaker, in which rollers equipped with knives tear the rags to pieces and mix them with water to form a pulp. Chloride of lime is then used to bleach the pulp, which passes on to a sizing machine, where the pulp is mixed with alum and a kind of soap made from resins which give better results than ordinary glue. The pulp is then ready for transformation into paper. It is poured upon an endless cloth or "web" made of fine brass wire which travels on rollers continuously in one direction. At the same time a shaking or vibratory motion is communicated to it, and this causes the fibers to become more closely connected in what is called a felt. Words or designs to be transferred to the paper and called watermarks are woven into the wire cloth web and rise slightly above the rest of the surface. The machine completes its work by winding the newly made paper into rolls for convenient handling.

The paper and wood pulp production of the United States in 1921 had a total value of $788,059,377, while the manufacture of paper goods "not otherwise specified" amounted to $107,000,000 more. There were 729 establishments engaged in paper and wood pulp manufacture, employing 113,000 wage-earners and a capital of nearly a billion dollars. The paper produced in the United States in 1921 included the following varieties and quantities: Newsprint, 1,226,189 short tons; standard news, 1,130,943 tons; book paper, 725,992 tons; paper board, 1,664,931 tons; box board, 1,122,336 tons; wrapping paper, 651,605 tons; bag paper, 130,863 tons; fine paper, 242,485 tons; tissue, 148,142 tons; hanging paper, 69,725 tons; felt and building paper, 286,111 tons; other grades, 210,274 tons; making a total of all grades of 5,356,317 tons. The total production of wood pulp in the same year was 2,801,438 tons, and it may be noted that the year's production of both paper and wood pulp in 1921 (an off-year for business) was much smaller than in the two preceding years and showed a considerable increase in the last half of 1922 and the first half of 1923.

Besides the large output of newsprint paper in the United States, the country imported nearly 800,000 tons of newsprint in 1921, and 697,000 tons of wood pulp. The paper imports of all kinds had a total value of $92,462,472, while the exports of paper amounted to approximately $50,000,000.

Manufactures of paper in the United States in 1920, that is, articles made of paper, employed 1,919 establishments, 90,000 wage-earners, and a capital of over $240,000,000. The value of the annual product exceeded $440,000,000.

In connection with the production of paper it may also be noted that there were in the United States in 1920 no fewer than 17,362 establishments engaged in the business of printing and publishing newspapers and periodicals, with more than 120,000 employes; also 13,089 book and job printers and publishers, with 123,000 employes. The combined output of the printing and publishing business for the year was valued at $1,699,789,229. The primary horse-power employed in this industry, including paper-making and printing, was 2,351,224, of which 362,123 was utilized in printing and publishing.

As far back as 1789 the United States had a tariff on paper, the duty fluctuating from time to time, until in 1913 the Underwood tariff placed newsprint on the free list, where it was allowed to remain in the Fordney Tariff Bill of 1922.

Paper production increased from 78,000 tons in 1880 to 1,512,000 tons in 1920. Production of newsprint paper in the United States in 1910 amounted to 1,278,000 tons as against Canadian production of 161,000 tons. The production in the United States for the year 1920 amounted to 1,512,000 tons, an increase of only 18 per cent of the American consumption, duction in 1920 amounted to 883,000 tons,

an increase of 443 per cent over 1910. Imports from Canada into the United States in 1910 amounted to 25,000 tons, or 1.9 per cent of the American consumption, which importation at that time was 11.19 per cent of the Canadian production. In 1920 Canadian exports to the United States amounted to 679,910 tons, an increase of 2,720 per cent over 1910, this importation being 77 per cent of the total Canadian production for 1920.

These figures show how much faster the production of newsprint paper has expanded in Canada than in the United States. Imports from countries other than Canada in 1910 show 31,661 tons, which was the maximum until 1920, when it reached 50,090 tons.

The rapid development of Canadian mills has been due to their location on streams where their pulp wood could be floated from the forests to the mills, thus saving considerable in freight costs. Mills in the United States to a very considerable extent, are obliged to ship pulp wood by rail, or to purchase pulp from mills located in the woods, shipping the pulp by rail. In 1909 the Tariff Board reported its finding a difference of $5.35 per ton in the cost of manufacture of newsprint paper in favor of the Canadian manufacturer. In selling paper in the United States the Canadian manufacturers absorb the freight rates, which they can readily do because manufacture is cheaper in Canada than in the United States.

Competition from Europe has been quite severe in recent years, importations during 1921 from Europe approximating 11,000 tons per month at prices considerably below those of either United States or Canadian made paper. See PAPYRUS; PARCHMENT.

Paper Money, a sheet of paper, silk, linen, or similar material stamped with an official value and designed for use as money. Any article passing from hand to hand in payment is money—currency—but bankers find it convenient to designate metal money and paper money as coin and currency respectively. A gold ten-dollar piece beaten into a nugget is still worth within a fraction of a cent as much as it was before. The owner may exchange any number of such misshapen pieces at a United States mint for as many ten-dollar gold pieces, less the actual cost of melting and coining anew. Silver money may be hammered into silver bars of cash value the world over, but paper money pounded to a pulp is not worth hauling to market. This distinction is expressed by saying that coin has intrinsic value, and that paper currency has no intrinsic value.

If backed by value, as silver or gold in a vault, paper currency is representative money. It has no value in itself, but it represents value. If issued because the coin of the realm has run out and the government is in need, paper currency is called fiat money. Representative money is a convenience. A roll of bills is handled with less effort by far than a bag of coin. Representative money is legitimate, and is growing in favor. Fiat money is a delusion and a snare. The one objection to paper money is the possibility of setting printing presses at work at any time and converting sound representative currency into a volume of worthless fiat money that nobody would accept. Sound finance requires that every bank note, or government note, that is to say, that every piece of paper currency be convertible into a corresponding coin if the holder should so demand. When paper is convertible nobody wants to convert it, nobody wants to be bothered with the coin; when currency is not convertible nobody wants to touch a dollar of it. If the United States government were to set its printing offices in operation and give away enough ten-dollar bills to make every man, woman, and child a nominal millionaire, making this currency legal tender for all private and public debts, the total issue being so large that redemption in coin was out of the question, a crash would follow. Those to whom money was owing would be obliged to take the paper or nothing. This would be a virtual confiscation or wiping out of all debts. Otherwise, the currency would be worthless. A baker would not give a loaf of bread for a sackful of it. Gold and silver coin would disappear like rats into their holes, the country would be without money, and business would be brought to a standstill.

Representative money is not of recent origin. The Chinese, now so far behind in

many respects, are thought to have been the first, not only to invent paper, but the first to issue paper money. The Carthaginians are credited with using stamped bits of leather. Iron money was issued by the Byzantine emperors. In 1768 Catherine II of Russia issued paper money to take the place of the clumsy, bulky copper kopeck of her realm. One of the most famous instances of an over issue of paper money is that of the French assignats. These were issued to defray war expenses and were based on the recently confiscated property of the church. The first issue in 1790 was for the modest sum of $80,000,000, and really saved the day for the young republic. This method proved too easy. The government was confiscating the property of wealthy runaways daily. Why not issue more assignats? The issue rose to a total of over $8,000,000,000 by 1796. A gold piece was worth three hundred times its face in assignats. Attempts were made to bolster the issue, but in 1797, seven short years from the start, the scheme collapsed. The total issue, the $8 with nine ciphers after it, was worth less than a penny, save that the bills were sought as financial curiosities.

Representative money has been issued by the banks of the world we may say for centuries. The practice of issuing bank notes not guaranteed by the government is believed to have been general in Germany and England during the seventeenth century. In 1858 the Bank of Sweden, now the Riks Bank, began the issue of notes payable at sight. This is considered the beginning of modern convertible paper money. The Bank of England has standing authority from Parliament to issue notes to the extent of $70,000,000. The German banks and the state issue together about $125,000,000 worth of notes. The Bank of France, a monopoly, has notes to the value of $1,000,000 in circulation. The Austro-Hungarian Bank, likewise the only bank authorized to issue paper money, had $500,000 outstanding in 1907. Nippon Ginko notes, or notes of the official bank of Japan, were issued to the limit to defray war expenses. They were in circulation to the extent of $350,000,000. Canadian banks under government supervision had in 1909 $76,000,000 outstanding in the form of paper money. These notes are in denominations of five dollars or greater. The Dominion government issues, in addition, four-dollar, two-dollar, one-dollar, and twenty-five-cent notes.

The use of paper money was introduced into the colonies from England. Virginia placed tobacco in storage and used the receipts for currency. The earliest issue of paper currency in the colonies was that of Massachusetts in 1690. The notes were used to pay soldiers. No less than twelve subsequent issues were made by Massachusetts. The practice of issuing paper money, once started, was taken up by all the colonies and was continued up to the formation of the general government. A very interesting treatment of colonial paper may be found in the article on paper money in the *Americana*.

Several issues of American paper are of note. Money was authorized by the Continental Congress in May, 1775. The issue was a war measure and was resorted to frequently. The notes sank in value until a silver dollar would buy 225 or even 400 paper dollars. The value ran so low that "not worth a continental" became a popular expression. Nevertheless, the continental money circulated in a way until 1781. Confederate paper money was issued during the Civil War to the amount of nobody knows how much, but up into the millions. The first note was a five-dollar bill issued July, 1861; the last issue appeared in February, 1864.

The paper money now in circulation in the United States is representative—strictly so; and may be converted into coin on demand. There are two general classes—notes and certificates issued by the national treasury, and notes of national banks. The latter are secured by bonds deposited in the United States treasury, and are guaranteed, dollar for dollar, by the government. For the first time in many years the paper money in circulation in the United States exceeded the gold and silver money. This phenomenon, occuring first in 1919, was occasioned by the financial changes consequent upon the close of the World War

and subsequent readjustment. In the following table are given the figures on metal and paper circulation from 1914 to 1921, inclusive:

Year ending June 30	Coin, including bullion in treas.	U. S. notes & bank notes
1914	2,638,496,956	1,099,791,915
1915	2,739,241,077	1,250,215,109
1916	3,206,867,812	1,276,024,126
1917	3,785,690,795	1,622,299,231
1918	3,807,161,348	2,933,910,946
1919	3,577,607,287	3,941,181,713
1920	3,221,676,433	4,672,821,666
1921	3,786,221,846	4,241,173,650

For a further discussion of currency see BANKING; GREENBACKS; COUNTERFEITING.

Papier-Mache, pā-pya′-mä-shā′, a term applied to paper pulp pressed and molded into a form resembling wood or plaster. The more durable kind has some binding material such as glue, gum-arabic or linseed-oil added before being compressed into its final form. After baking it becomes so hard it may be planed or filed, and polished. The making of this paper product originated in Persia or Kashmir, importation of it into England in the form of trays and boxes beginning as early as the middle of the eighteenth century. There have been constant improvements in the manner of its making which have greatly improved the quality, with a consequent increase in its usefulness. Under various trade names it is widely used for utensils of all kinds.

Papineau, Louis Joseph (1786-1871), a French-Canadian political leader whose entire life was devoted to the cause of independence for Canada, was born at Montreal. He studied at the Seminary of Quebec and later studied law, and was called to the bar in 1810. In 1809 he was elected to the Lower Canada legislature for Kent, and in 1811 was chosen to sit for one of the districts of Montreal. Papineau's was a fervent nature but his vision was not broad; the idea of Canadian independence possessed him early in his career and colored all of his later public acts. He commanded a company of militia during the War of 1812, but saw little service. As the leader of the French-Canadian party, Papineau was chosen speaker in 1815, serving for twenty-two years.

His first open break with the British government occurred in 1834. He attempted to force the home government to make the provincial council elective instead of appointive. Through his influence the assembly refused to grant supplies to the governor of Lower Canada. Supplies were withheld for three years; affairs in Lower Canada became ever more critical; and in 1835 Papineau was visited by Mackenzie (see MACKENZIE, WILLIAM LYON), leader of the party for revolution in Upper Canada, and a cooperative agreement was made between them.

In the spring of 1837 the home government declared that it could not grant an elective council, at the same time authorizing the Governor to use the money he had in the treasury to procure supplies, since Papineau and his followers refused to give them. Upon this, Papineau made a number of fiery speeches to the people; one result was that he lost his captaincy of militia; another was the rebellion of 1837. There has always been doubt as to whether Papineau favored this action. It is true that his speeches were largely responsible for the outbreak; it is also true that he fled to the United States when trouble began. Remaining there for two years, he later went to France, returning to Canada after the amnesty of 1847. He returned to find his influence gone, however; he was elected to the Assembly of the Union, but retired in 1854 and lived in seclusion until his death.

Papyrus, pa-pī′rŭs, the Egyptian paper plant. It is straight, stout, tall, reed-like, aquatic plant of Egypt and Palestine. Botanically papyrus is a cyperus and is a member of the sedge family. The leafless stem rises from four to fifteen feet above the water, and has an umbrella-like top of delicate green rays. The bark was used by the ancients for paper. A section cut from the lower part of the stem yields a number of delicate layers which are separated and laid out on a flat surface with overlapping edges. A second layer is spread crosswise, and the sheet thus formed is subjected to pressure. The material contains enough natural mucilage to cause the pieces to adhere. These sheets, pasted together

end to end, form the papyrus roll on which the books of the ancients were written.

The papyrus plant formerly bloomed abundantly in the lower Nile, but it is now extinct there. It fringes the margins, however, of the sluggish regions of the upper Nile. It is reared as a curiosity in many botanical gardens. A plantation of papyrus in a small river near Syracuse, Sicily, is regarded as a botanical curiosity. It is visited by many thousand tourists annually. The United States Department of Agriculture is investigating the question of introducing papyrus as an ornamental reed for the waters of Florida and other Gulf States.

See PARCHMENT.

Para, a city of Brazil. It is on the Para River, one of the mouths of the Amazon. The other mouths are obstructed by sandbars and are difficult of navigation by reason of great tidal waves. Para is sixty-five miles from the open sea, but the estuary is deep, and wharves of concrete have been constructed, thus permitting ships to tie up in thirty feet of water. Para has a unique situation. It is unlikely to have a rival on a thousand miles of coast line. It is 3,000 miles from the head of navigation of the Amazon; 3,000 miles from Buenos Ayres; 3,000 miles from New York; 3,000 miles from Lisbon; and 4,000 miles from London. It commands the commerce, present and future, of the greatest and possibly the most fertile river basin in the world. Para is the worlds' headquarters for rubber. It now fixes the price of millions of dollars worth of rubber annually. The province of Para, of which the city is the capital, is the principal rubber producing district of South America, and the condition of the supply here greatly affects the rubber markets of North America and Europe. The population was estimated at 236,400 in 1920.

Parabola. See CONE.

Paracelsus, păr-a-sĕl′sus (1493-1541), a noted Swiss physician. At one time professor of medical science at Basle, he was ejected on account of offense given. Paracelsus disputed current authority in medical matters. He taught that sickness is due to chemical disturbances in the system and can be cured by the proper chemical. Paracelsus made many wonderful cures, but he was arrogant and boastful and hard to get on with. He ended his life in utter poverty. See article on GALEN, whose teachings were bitterly opposed by Paracelsus. See MEDICINE.

Parachute, a device made of some light strong cloth that is used for breaking the fall from a balloon or aeroplane. It is shaped like an umbrella, but has no ribs, and instead of a handle has a series of stout cords to which a small trapeze, hook or life belt is attached. The first recorded use of a parachute as a means of descending from a balloon was in Paris in 1797. The usual method of carrying a parachute on a balloon is to suspend it from the bottom of the basket. When the balloon rises the parachute remains open by the pressure of the air.

Many methods of carrying parachutes in aeroplanes have been tried, and at present it is usual for the avaitor to carry it strapped to his back and folded in such a manner that the release of a cord will cause it to open. The parachute is attached to the wearer by means of a strong belt that passes snugly around the body under the arms.

Paradise, a word used variously to designate a place of unalloyed happiness. The word comes to us from the Greek, but is of Oriental origin. It appears first in the Greek of Xenophon, who uses it with the meaning of a park or pleasure ground, but always in reference to the great hunting parks of the Persian kings. In the Septuagint, a Greek translation of the Old Testament, it is used as a rendering of the Hebrew "Garden of Eden." Later, it is evident, a figurative meaning was given to the word and it came to be applied to the abode of the blest after death.

Paradise Lost, an epic poem by John Milton. It is one of the masterpieces of English poetry and one of the great epics of the world. *Paradise Lost* was published in 1667. It was written probably between 1658 and 1665. Milton had made a list before he was thirty-five years old of about a hundred possible subjects for the great poem he felt himself destined to write. One of these subjects was King Arthur and

his Knights; but *Paradise Lost* held the first place on the list and was the subject chosen. Four different drafts are preserved, showing the different ways in which the poet thought of treating his subject. He intended to use the dramatic form, but decided finally on the epic. The poem consists of twelve books containing over 12,000 lines, and deals with the fall of man, the subject being set forth in the first lines of the poem:

Of man's first disobedience, and the fruit
Of that forbidden tree, whose mortal taste
Brought death into the world, and all our woe,
With loss of Eden, till one greater man
Restore us, and regain the blissful seat,
Sing, Heavenly Muse.

Many readers get no further, sharing the sentiments of Waller, one of Milton's envious contemporaries: "The old blind poet hath published a tedious poem on the fall of man. If its length be not considered as a merit, it hath no other."

Paradise Lost is an account of the rebellion of Satan against the power of the Almighty and of his banishment with all his followers. Satan, the hero of the poem, is universally conceded to be one of the most heroic characters in literature. One's only regret is that Satan was on the wrong side. *Paradise Lost* not only mirrors the Puritanic view of the Creator and of punishment, but such was the influence of this poem that it practically fixed theological views on these subjects for two centuries.

See EPIC; MILTON.

Was there ever anything so delightful as the music of the *Paradise Lost?* It is like that of a fine organ; has the fullest and the deepest tones of majesty, with all the softness and elegance of the Dorian flute; variety without end, and never equaled, unless, perhaps, by Virgil.—Cowper.

After I have been reading the *Paradise Lost* I can take up no other poet with satisfaction. I seem to have left the music of Handel for the music of the street.—Landor.

Paradise Lost is perhaps the loftiest monument of human genius.—Channing.

Paraffin, a tasteless, odorless, fatty substance proof against the action of acids and alkalies. It is most extensively produced in the refining of crude petroleum. Paraffin is used for a variety of purposes. Laundrymen use it to give a polish to fine linen. Cartridges are coated with it to prevent their sticking in the gun barrel. Paper and cloth are treated with paraffin to render them waterproof. It makes excellent candles, equal to the best wax. Housewives pour a film of melted paraffin over their preserves and canned fruit to protect them from germs in the air. Scientists desiring a thin shaving of a substance to place under the microscope imbed the tissue in paraffin to hold it firm for the knife. Paraffin is used in the manufacture of chewing gum. Brewers coat the inside of beer barrels with paraffin. It is used in the insulating covering of electric wires. Great Britain supplies the greater part of the paraffin of commerce. Much paraffin is obtained from the soft coal near Bonn, Germany. The paraffin made in the United States comes chiefly from Bradford, Pennsylvania.

Paraguay, pä-rä-gwī′, an inland republic of South America. It lies between Argentina and Brazil, and borders on the north with Bolivia. Area 75,673 square miles, about that of Nebraska. The population is reckoned at 800,000, including 50,000 Indians. In fact, the population is a mixture of Spanish, Negro, and Indian elements. There are from four hundred to a thousand each of English, French, German, and pure Spanish residents, intent chiefly on ranching or merchandising. The country achieved its independence from Spanish rule in 1811. The present government is modeled on that of the United States. Asuncion is the capital. The Roman Catholic is the national religion. Freedom of worship is permitted to all denominations. A system of free education has been established. Attendance is compulsory. Spanish is the language of the schools. Protestant schools are maintained by private parties. A national university is maintained at Asuncion, with a score of professors and two hundred to three hundred students. The government pays the expenses of a few students abroad to study engineering.

Paraguay is in the La Plata basin. A considerable portion of the country lies in the great South American grazing region. Cattle, horses, mules, sheep, goats, and swine are valued at $250,000,000. Meat, hides, hair, and wool are sold to the merchants at Buenos Ayres. The most impor-

tant product from a money point of view is *yerba mate,* or Paraguay tea. The government leases the yerbales or herb lands to companies. They are managed somewhat on the plan of the blueberry barrens of the northeastern United States. The annual export value of mate leaves is very high. The industry gives employment to a vast number of pickers and curers. Tobacco is an important crop. Fruit growing is an increasing industry. Indian corn, beans, and sugar-cane, potatoes, rice, and peanuts are raised. Bananas, coffee, and oranges are exported. Luscious oranges may be had at the rate of eight for one cent. They are loaded like potatoes by barefooted women. Immense forests yield valuable timber, including the quebracho (kā-brä′chō), which contains one-fourth of its own weight of tanning material.

There are at present no valuable mines, but the country has not been explored thoroughly. There is iron in the south. Veins of copper ore are known to exist. Building marble and valuable clays abound. Wild animals are yet numerous. Alligators lie on the mud flats of the Parana.

Asuncion is the metropolis of the country. It receives about 3,500 calls a year from steamers and sailing vessels. A line of railway from Asuncion runs inland 156 miles. There are 950 miles of telegraph lines connecting with those of Argentina. The capital has telephones and tramways.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	75,673
Forest area, acres	20,000,000
Population (estimated)	1,800,000
Chief Cities:	
Asuncion	99,836
Villarrica	26,000
Concepcion	15,000
Luque	15,000
Carapegua	15,000
Number of departments	15
Members of senate	20
Members of chamber of deputies	40
National revenue	$5,000,000
Bonded indebtedness	$9,500,000
Farm area, acres	57,231,250
Oranges exported (1920)	133,360,000
Quebracho extract, tons	24,061
Domestic Animals:	
Horses	478,000
Mules	17,000
Asses	18,000
Cattle	5,249,000
Sheep	600,000
Goats	87,000
Swine	61,000
Imports	$8,100,000
Exports	$9,000,000
Miles of railway	232
Teachers in public schools	1,808
Pupils enrolled	78,399

Paraguay River, a commercially important South American stream. It rises in the plateau region of western Brazil, flows in a generally southerly direction for 1,500 miles, and unites with the Parana River (which see) on the Paraguay-Argentina boundary. It is navigable to within 300 miles of its headwaters, and its entire course is in the temperate and productive zone of South America. The principal tributaries of the Paraguay are the Pilcomayo and the Vermejo. On the banks of the Paraguay is Ascuncion, capital of the Republic of Paraguay, and first-class steamer service is maintained between this city and Buenos Ayres, the capital of Argentina.

Parallax, a difference in the apparent direction of a heavenly body, due to different positions of the viewpoint. Persons standing at opposite points on the earth's surface will see the same star in slightly different directions. In astronomy parallax is measured by the angle included between lines drawn from the object to the observer, and from the object to the center of the earth or other point taken as a standard center. Evidently a heavenly body immediately above the observer has no parallax. The farther away a body, the less its parallax. The parallax of the moon is 57′. That is, to the lunar observer, the earth would seem to have a diameter of 114′. If star observations be made at intervals of six months when the viewpoints are at opposite diameters of the earth's annual orbit, the parallax becomes appreciable, even for the most distant star. By the aid of trigonometry this apparent shifting of direction is made use of by astronomers in calculating the distance of heavenly bodies.

Parana, the second largest river of South America, has its source in the union of the Rio Grande and Paranahyba rivers in the southern part of Brazil. Flowing

generally southward, the Parana forms the Brazil-Paraguay and Paraguay-Argentina boundaries, and then drops down through Argentina, entering the Atlantic Ocean through the estuary of the River La Plata. On the Paraguay-Argentina boundary it is met by its largest tributary, the Paraguay; and the Uruguay joins the Parana at the head of the La Plata estuary. From the Rio Grande-Paranahyba confluence to the Atlantic, the distance covered by the Parana is 2,270 miles. It drains an area almost as large as that drained by the Mississippi.

Below the point where the Paraguay River enters, the Parana is navigable for 1,000 miles, the largest river boats ascending this far; and ocean going vessels ascend 400 miles to Rosario, Argentina. The river flows through some of the most fertile regions of South America.

Parasite, a plant or animal that lives at the expense of another. Parasitic animals may live on the outside, as lice and ticks; or they may reside in the interior, as the tapeworm of man and beast. Parasitic plants are to be distinguished from air plants that fasten themselves to the bark of a tree and live mainly on the air or, at most, on rotten bark and plants, and from plants that feed on dead and decaying matter, but the one shades off into the other so that it is difficult to draw a fast line. A parasitic plant sends roots or absorbing branches into the sap wood of its host and feeds on the sap found there. Quite a number of flowering plants are parasites. Some are green, as mistletoe and bastard toad flax; others are waxy, as dodder and Indian pipe. Rusts, smuts, and mildews which attack crops are parasitic fungi. Originally, a parasite was a person, one who sat beside another, a hanger-on at the table of some rich patron, with the probability of winning a welcome by flattery and sycophancy. See TAPEWORM; MISTLETOE; DODDER.

Parcel Post, as now conducted in the United States by the Post Office Department, was established by law of August 24, 1912 (37 Stat. 557) redefining fourth-class mail matter and the rates of postage at which it is carried. The official recommendation of a parcel post was contained in the report of the Postmaster-General for 1904, reading as follows:

With the establishment of rural mail delivery and the increasing extension of rural telephone service by private interests there has grown up a demand by the patrons of the rural service for the delivery of small packages of merchandise, such as foodstuffs, tobacco, drygoods, drugs, etc., on an order to the local merchant by postal card, telephone, or otherwise. The value of these packages of merchandise is usually small and the present rate of postage of 1 cent per ounce is practically prohibitive. The patron or merchant cannot afford to pay 16 cents for the delivery of a pound of coffee or tobacco, or similar articles; but if a special rate were established on such matter from the distributing office for delivery to any patron on the rural routes from that office, it would be a great convenience to the patron and become a source of revenue to the department.

It is therefore recommended for the consideration of Congress that a rate of 3 cents per pound, or any fractional part thereof, be authorized for packages of books or merchandise, not exceeding 5 pounds, mailed at the distributing office of any rural free delivery route for delivery to a patron on said route. This rate should apply only to packages deposited at the local post office for delivery to patrons on routes emanating from that office, and not to mail transmitted from one office to another. The rate of 3 cents per pound would be ample remuneration for the department, because there is no expense for railway transportation and the system by which these packages are to be delivered is already established and the delivery would entail no additional expense upon the department. A special stamp could be provided for this class of matter.

This recommendation of Postmaster-General Wynne was renewed repeatedly by his successors until finally, as urged by Postmaster-General Hitchcock in his report for 1911, modified to permit of a weight limit of 11 pounds to conform to that of the international parcel post, it took form through action of Congress in 1912.

For purposes of parcel post the country was divided into eight zones, to be measured from each point of mailing as the radial center, as follows: First zone, 50 miles; second, 50 to 150 miles; third, 150 to 300 miles; fourth, 300 to 600 miles; fifth, 600 to 1,000 miles; sixth, 1,000 to 1,400 miles; seventh, 1,400 to 1,800 miles; eighth, over 1,800 miles. A differentiation designated "local" was made for parcels delivered from office at which mailed.

The rates of postage for fourth-class

mail matter (previously 1 cent per ounce, and limited to 4 pounds) were originally fixed at 5 cents a pound and 1 cent for each additional pound in Zone No. 1 on a sliding scale ranging up to 12 cents a pound and 12 cents for additional pound in Zone No. 18. The limit of weight was fixed at 11 pounds, and the limit of size for packages at 72 inches of length and girth combined.

Modifications of the rates and regulations of the new service soon followed. The first, effective August 15, 1913, increased the limit of weight for the first and second zones from 11 pounds to 20 pounds, and reduced the rates of postage for those zones. In March, 1914, books were added to the parcel post classification, and seeds, plants, bulbs, etc., were accorded parcel post zone rates. On July 1, 1914, the weight limit for the first and second zones was increased from 20 to 50 pounds, and for all other zones from 11 to 20 pounds; and the rates of postage were reduced in the third, fourth, fifth, and sixth zones. In July, 1915, the size allowable for packages was increased from 72 inches to 82 inches, then to 84 inches, in length and girth combined. The limit of weight was further increased, effective March 15, 1918, from 50 pounds to 70 pounds for parcels mailed for delivery in the first, second, and third zones, and from 20 to 50 pounds for all other zones.

For a short time after the inauguration of parcel post, a special postage stamp was employed, permitting separation of parcel-post revenue from other postal revenue. But this was soon discarded, so that the revenue from fourth-class mail matter is represented in the sale of postage stamps indistinguishable from other mail classifications requiring postage stamps. The only statistical data disclosing the volume of business, weights of parcels, distances carried, and postage paid must therefore be found in the tests made from time to time, for 15-day periods, which however were interrupted during the war.

The growth of the parcel post has been tremendous. The number of parcels mailed in 1913 was 17,148,200; in 1920 it had increased to 55,352,860, an increase of 222.8 per cent; while the total weight increased from 30,371,437 pounds to 169,641,199 pounds, or an increase of 458.6 per cent. The average weight of parcels increased during the same period from 1 pound and 12 ounces to 3 pounds 1 ounce, while there was a decrease in the average postage paid from 3.8 cents in 1913 to 3.2 cents in 1920.

One phase of the parcel-post development is found in its extension for local delivery service to department stores and retail merchants in certain cities, supplanting their own delivery systems, and in the transmission of shipments by mail-order houses, which now utilize the parcel post whenever it is to their advantage.

Theoretically the minimum charge for parcel post is 5 cents, the zone tariff being based upon a 5-cent local charge with additions for additional weights and distances. As a matter of fact, the actual minimum charge is 1 cent, inasmuch as parcels going as fourth-class mail matter, weighing less than 4 ounces, may be sent at the rate of 1 cent per ounce regardless of distance, while books or catalogues, seeds, cuttings, bulbs, roots, scions, and plants may go in the mails at the rate of 1 cent for each 2 ounces, the zone rates applying only when the weight is over 8 ounces.

Mail matter sent by parcel post may be insured at low rates. During the fiscal year 1914, the first year of its operation, 13,363,459 parcels were insured; during the fiscal year 1921, the number insured increased to 116,326,644, an increase of 870 per cent. Insurance claims to the number of 368,085, aggregating $4,569,087, were paid by the Post Office Department and local postmasters in the fiscal year 1920, but the revenue from insurance showed a net profit of approximately $2,500,000.

Since all classes of mail matter are transported in the same railway cars, which are paid for on a space basis, only estimates of the cost of carrying parcel post are possible. Before congressional committees, postal experts have placed this cost, beyond the initial zone, at 1 cent per pound for every radial haul of 200 miles. Total payments for the year 1921 for railroad transportation for all classes of mail matter amounted

to $91,853,000, of which it was estimated that parcel post represented 75 per cent of the weight and over 80 per cent of the space.

The report of the Postmaster-General for the year 1921, after reciting the results of the last previous test weighing, says: "The impression prevails that the parcel post is producing a large profit. It was stated that it made a profit of $10,000,000 for the fiscal year ending June 30, 1920. This was based largely on pre-war figures. It is my opinion that the parcel post by no means pays for itself."

Parcel post, however, through its unprecedented expansion, has become within a few years one of the important facors in our transportation system. From a comparatively negligible part of the postal business, fourth-class mail matter or parcel post has come to constitute three-fourths of the total postal tonnage, with corresponding increase of cost to the Post Office Department. It has gone far beyond the original proposal for local distribution through the mails of small parcels in order to utilize the empty space in rural vehicles for the benefit of rural patrons, and it is now doing largely what was formerly the express business of the country.

Parchment, the skin of a sheep or goat prepared for use as writing material. The name is a corruption of Pergamus, a city of Asia Minor noted for its manufacture. After the Saracens occupied Egypt and cut off the world's supply of papyrus, Pergamus drove an immense business in tanning skins as a substitute for papyrus. In the making of parchment the skins are first soaked in lime to remove the hair. They are then scraped, shaved, washed, stretched, and dried. The surface is rendered smooth and hard by rubbing with fine chalk and pumice stone. Parchment is still in demand for documents of importance, diplomas, bindings, and trimmings. Wolf-skin parchment makes the best drumheads. Vellum is a fine parchment made of the skin of a kid or a young calf. The Eskimos make a kind of parchment from the entrails of seals. They use it for bags, boots, robe linings, and the like. Owing to the expense of parchment the medieval monks were wont to fade the ink of old volumes and use the parchment again. A second-hand roll of this sort was known as a palimpsest. See PAPYRUS; PAPER; BOOK; TANNNING.

Pardon, an act of clemency or grace exercised by an authority, by which the penalty of the crime for which the alleged criminal was convicted is remitted.

In the United States, the supreme pardoning power is vested in the President, whose power is absolute except in cases of impeachment. Within the individual states, the governor is usually given the authority to exercise clemency.

England's pardoning power is vested in the king, restricted at different times by Parliament. In 1679 a Habeas Corpus Act was passed, prohibiting the crown from pardoning the offense sending a person to prison without the realm.

Although a pardon may be either absolute or conditional, most pardons are granted for all time. After a war there are usually a very large number of pardons by the President, as many men refuse military service, and are therefore imprisoned. After the war, these offenders are usually given their liberty.

Out of the pardon privilege have grown such systems as parole and reprieve. In the parole the prisoner is allowed to go free as long as he behaves properly, while the reprieve is merely a suspension of sentence. Both of these developments have proved effective in many instances. When a pardon is extended to a political offender, it is called an act of amnesty.

Paregoric. See OPIUM.

Parent-Teacher Association. This organization, which has for its purpose the advancement of education in the public schools, originated in 1897 at the organization of the National Congress of Mothers and Parent-Teacher Associations. The chief purposes of the organization are to bring parents and teachers more closely in sympathy with each other and to give mothers an opportunity to study the best methods for the development of the child. Also to enable parents to become familiar with the work of the school and, in this way, form a close connection between the school and the home. A third purpose is to encourage parents to become acquainted

with conditions affecting the life of children outside of school and the home and to awaken united community interest in child welfare.

Parent-Teacher Associations are now organized in practically all schools of the cities throughout the United States and many counties have rural organizations. Meetings are held monthly or, in case of emergencies, more frequently. Every organization is officered by a president, vice-president and secretary, and these officers, or other members appointed for the purpose, are responsible for the monthly programs. Frequently a speaker of authority on some subject closely related to the work of the association is secured for the address. Round tables are held and the social phase of the gathering receives its due share of attention.

The influence of the Parent-Teacher Associations has been far beyond the expectation of the most sanguine advocates of the movement. Among the important improvements secured are:

1. Better school equipment in the way of furniture, libraries and other material.
2. Better nourishment of children in those schools where assistance along this line is necessary.
3. The establishment of community centers (see COMMUNITY CENTER).
4. Provision for instruction in home economics in many schools where this subject had not previously been introduced.
5. Improvement of streets leading from the principal streets or roads to the school building.
6. Provision for a course in physical culture for mothers.
7. The establishment of summer camps for mothers and children.
8. Education of mothers in infant hygiene, through which the lives of thousands of infants have been saved.
9. Medical inspection of schools.
10. Establishing state loan funds for the education of boys.

The work of each association is naturally adapted to the needs of its locality, so that in detail programs must vary. However, throughout the country, through this great organization, the movement in the interest of children and the improvement of public schools is practically along the same lines. The Parent-Teacher Associations not only strengthen existing work but they constitute a strong support to the progressive teacher who is ready and anxious to change her methods to meet the demands of the new conditions. See NATIONAL CONGRESS OF MOTHERS AND PARENT-TEACHER ASSOCIATIONS.

Paris, in Greek legend, the second son of Priam, king of Troy. Before his birth his mother Hecuba dreamed that she had given birth to a firebrand that set fire to the city. As this dream was interpreted to mean that her child would bring disaster upon Troy the infant was exposed on Mount Ida. Here he was found and nourished for a time by a she-bear. Later the shepherd, whose task it had been to leave the child on the mountain, finding him still alive, took him home and cared for him. Paris grew to be a beautiful youth. His birth was discovered and he was received in Priam's household, where he married Oenone, daughter of a river god. When the dispute over the golden apple, inscribed "to the fairest," arose between Hera, Aphrodite and Athene, Zeus ordered that the decision be left to Paris. Hera promised him power and riches should he decide in her favor; Athene offered glory and wisdom; Aphrodite promised the most beautiful woman in the world for his wife. Paris decided in favor of Aphrodite and by the aid of the goddess carried off Helen, the wife of Menelaus, king of Sparta, and thus brought on the Trojan War. Of course Paris won the enmity of Hera and Athene in deciding for Aphrodite. Paris is represented in the *Iliad* as skillful in war, but he was light and fickle in character and failed to distinguish himself during the siege of Troy, especially as he obstinately refused to give up the fair Helen. At the time of the fall of the city he was wounded by a poisoned arrow and sought Oenone to be healed. The neglected nymph repulsed her faithless husband and let him die of his wound. The judgment of Paris, representing him with the apple in his hand, appears on antique vases. See TROY; HELEN; HERCULES; PRIAM; APHRODITE; APPLE OF DISCORD.

Paris, păr′ĭs, the capital of France. It is situated on the Seine River, about 100 miles from the sea. The very center of the city consists of two islands in the Seine. They have been formed by consolidating many former small islets to which the Gallic tribe of the Parisii crowded in time of danger, and on which the original Roman citadel was erected. In the time of Louis XIV there were half a million people. Benjamin Franklin found about 600,000 inhabitants. The present city covers thirty square miles and had in 1921, 2,906,472 inhabitants. It is still growing rapidly. Paris is not only the largest city on the European continent, but it is the French capital, — the center of French thought, politics, art, and fashion. It is the most attractive large city in the world.

The banks of the Seine are protected by massive stone walls. Second-hand book dealers and others expose their wares on the coping. Stone steps lead down to the water's edge. Numerous craft dart this way and that, taking on and landing passengers. Wide stone-arched bridges cross at frequent intervals.

The map of the city has been reconstructed in modern times. Many of the historic streets have disappeared, and large areas have been razed, replotted, and covered with imposing edifices. There are numerous open centers called places. They are round, triangular, square, or of irregular shape. They bear the names of the Bastille, Hotel de Ville, Alesia, Eylau, L'Etoile (the star), Trocadero, Vauban, Republique, Nation, Vendome, Opera, Pantheon, etc. From these centers boulevards and avenues of uncertain number and direction radiate somewhat like spokes from the hub of a wheel. Napoleon began this sort of street engineering in order to establish centers where cannon might be placed to overawe the Parisians in case of insurrection. The idea works both ways, however. The modern Communists established themselves in the places and barricaded the streets in every direction.

In 1840-5 the city was surrounded by a line of fortifications called the Enceinte. It crosses the Seine twice and is twenty-one miles in length. The ramparts are thirty-two feet high, with a parapet or walk on top nineteen feet wide. They are surrounded by a moat forty-eight feet wide. They are strengthened by ninety-four bastions. The principal roads are defended at various distances from the walls by sixteen detached forts. The original cost of the fortifications was $25,000,000. During the Franco-German War of 1870-1 they were sufficient to hold the Germans at bay until the inhabitants were starved into surrender. From most directions the walls have the appearance of natural declivities. Railways and carriage roads enter by ample gateways so disguised with vines and shrubbery that the traveller is not aware usually that he is entering the largest fortification on the globe. A boulevard within follows the wall from gate to gate.

The city is situated over a vast bed of chalk. The system of sewerage is very complete. Four main tunnels, one for each quarter of the city, two on each side of the Seine, run parallel to the river and join in an underground chamber beneath the Place de la Concorde. A large tunnel carries the entire sewage to the Seine at a point well below the city. Large sewers, joined by smaller and still smaller ones, undermine all parts of the city. There are in all over 600 miles of these drains. They are infested by rats and have been the haunt of refugees and criminals. In *Les Miserables* Victor Hugo gives a vivid picture of an underground man-hunt. The sewers are one of the sights of Paris. Brief visits, in which ladies may take part, are permitted at times by the prefect of the Seine. A considerable portion of the sewage is utilized below the city in irrigating lands for market gardening.

Vast water reservoirs in the suburbs are filled by conduits from mountain streams a hundred miles distant. The streets of the city are paved chiefly with a combination of rubber and asphalt laid on a concrete foundation. Streams of water run along the open gutters night and day, not only cooling the air, but carrying street sweepings into the sewer system. For so thronged a city, the streets are comparatively quiet. They are brilliantly lighted, cleanly swept, and free from dust. Fifteen thousand cabs are for hire at a rate of forty cents an hour. A network of tramways and omnibus

SOME WONDERS OF MODERN PARIS

THE PALACE OF THE LOUVRE

In this group of buildings are gathered the most valuable art treasures in the world.

PARISIAN STREET SCENE

A view of the Boulevard de la Madeleine. To the left are the pillars of the Bourse.

lines is supplemented by steam launches and suburban railways. Both tramcars and omnibuses have seats on an upper deck, to which passengers, ladies included, may ascend by little outside stairways. Fares vary, transfers included, from three to ten cents, according to distance. At hours when there is a rush of travel numbered tickets are issued at the stopping places and passengers are admitted accordingly. When the seats are full, the car moves on. The conductor admits only those to whom he is able to offer seats.

Tobacco is sold only by government agents. The tobacconist's shop is indicated by a red street lamp. A system of pneumatic tubes, a sort of special delivery system, permits the sending of letters and postal cards from the center of the city to the suburbs. Postal telegrams may be sent at any hour of the day or night at the rate of one cent a word for points in France. Express packages are carried by the postal department at a small charge. Restaurants, cafés, and rooms to let are in evidence everywhere. The larger hotels have reading rooms, well supplied with English and American newspapers. French newspapers are carried on the street or sold at the windows of tiny octagonal street corner kiosques. *Le Petit Journal,* a penny paper, has a circulation of a million.

The ground floor of nearly all buildings, save in the most aristocratic quarters, is occupied by shops. The shops on the fashionable boulevards make a brilliant display of silks, drapery, ribbons, milliinery, gloves, jewelry, silverware, cut glass, confectionery, mirrors, furniture, table delicacies, and the thousand and one articles of personal and household adornment for which Paris is noted. The shopkeepers of Paris were the first to recognize the value of plate glass windows. The glass block and the department store of America originated in Paris.

The downtown streets are thronged all day and are especially gay in the evening. There are over forty theaters. Some of these have names of wide adoption, as the Opera, the Theatre Français, the Opera-Comique, the Odeon, the Vaudeville, the Varieties. Permanent circuses, panoramas, and hippodromes attract their shares of the crowd. The Grand Opera House is the finest and largest building of the sort in the world. Thirty different kinds of stone are employed for inside decoration.

It is impossible to give more than a general description of a city all the streets of which certainly no traveler and probably no native has even seen. With the aid of a map an irregular circle of boulevards may be traced about the heart of the city. They follow the line of former walls that, in the day of the Huguenots and Catharine de Medici, surrounded a smaller and older city. Within this circle and on the left or south bank of the river, lies the old Latin Quartier, or the university neighborhood, with its college buildings, library, museums, gardens, and art schools. Twelve thousand students are in attendance. Hard by is the Quartier St. Germain, the traditional residence section of the aristocracy, the quarter in which officials, foreign ministers, and ambassadors reside.

The Pantheon is a historic place of burial. The catacombs of Paris are here. The palace, garden and art gallery of the Luxembourg, garden of plants, and the menagerie, the factory where the Gobelin tapestry is made, Napoleon's tomb, the parliamentary buildings, the museum of artillery, the museum of Cluny, the military school and barracks, and the old abbey of St. Germain are all on the south side of the river. Adjoining the military school, and running from it in a broad band to the Seine, is the famous parade ground known as the Champ-de-Mars. In the days of the Revolution the Parisian men and women, to the number of 60,000, surrounded the grounds with an embankment, the better to see the ceremonies and pageants of the Republic. Trees were planted and seats provided for half a million people. Napoleon conducted open air festivals here; Louis Philippe presented his colors to the national guard here, and here Napoleon III distributed his emblems. The banks have been leveled. The Exposition Universelle of 1867, 1878, 1889, and of 1900 were held on the Champ-de-Mars. It has now been transformed into a beautiful park in which stands the Eiffel Tower from the top of which every day at 12:00 o'clock Greenwich time, the correct time is sent all over the world by means of wireless telegraphy.

The Museum-de-Cluny occupies the site of an old Roman palace. In 361 Julian was proclaimed emperor by his soldiers here. The baths of solid masonry still remain. The chamber for cold baths is 65 feet in length, 37 feet wide, and 59 feet high. It is of interest as indicating that the Roman occupation meant something more than marching a few legions across the country now and again.

The islands in the Seine midway between the university town on the south shore and the commercial town on the north shore were formerly the government quarter of the city. They still retain fine specimens of architecture. The Palais of Justice or supreme court; Hotel Dieu, or city hospital; the morgue; police headquarters; La Sainte Chapelle, a gem of Gothic architecture; and old Notre Dame Cathedral are here. The streets are extended to both shores by fine stone bridges.

The larger part of the city lies on the north or right bank. It is the city of fashion and commerce. The most noted boulevards, the largest opera houses, and the great hotels are on this side of the river. There are numerous monuments. The obelisk of Luxor, the Vendome column, and several triumphal arches are on this side. The Louvre, Tuileries, Place de la Concorde, and Champs Elysée extend along the shore in the very heart of the city for two miles. These grounds, with the river and bridges and approaching boulevards, form the most noted breathing place to be found in the world.

Among historic spots are the site of the old Bastille, the Quartier St. Antoine in which red republicanism broke out, and the National Library which possesses 2,500,000 well bound volumes. To pass along in front of each bookcase, aisles not counted, would require a walk of thirty-five miles.

The city markets occupy a vast structure of iron and zinc. There are ten pavilions, covering twenty-two acres. The site alone cost the city $12,000,000. There are more than 2,500 stalls in the market, which are rented to vendors of meat, fish, fruit, dairy produce, vegetables and flowers. At any time the market is open the visitor is presented with the merry sight of Paris bargaining for its food. But, of course, this great market does not supply all of Paris any more than Covent Garden Market supplies all of London with vegetables and flowers. Except for the meats and sea food, the greater part of the produce sold in the Paris market is grown near the city, in small truck farms; (see above).

The square tower of St. Jacques rises near the Hotel de Ville or city hall. It is all that remains of a handsome Gothic church of that name. It is 175 feet high. Pascal performed his celebrated experiments with his barometer here. The summit commands a magnificent view of the city. The Seine, the wide, white boulevards, the open pleasure grounds, the great buildings, and the country around form the busiest, the most populous panoramic view in Europe.

In addition to the artistic, scientific, and historic features of the city, it must not be forgotten that Paris is a "hive of industry" and a commercial center. The manufactures are extensive and varied. The railroads of the country, the most systematic arrangement of lines in Europe or any other country, center at Paris. A network of canals connects the Seine with the waterways of Belgium and France. Some of these canals reach the Seine by tunnels passing under the city. Capacious basins lined with docks and warehouses receive the canal boats.

The immediate vicinity of Paris is a zone of truck gardens. There are over 12,000 of these gardens. They comprise about two acres each and with their glass plant houses and other improvements they are valued at from $10,000 to $12,000 an acre. They rent for $400 or $500 a year. Most of the truck is taken to market by women.

During the World War the German armies made desperate efforts to reach Paris, and it is believed that the proposed capture was the stimulant for the construction of the German long range guns. Paris was bombarded from aeroplanes and Zeppelins and by artillery; more than 700 bombs were dropped from the air, and more than 300 shells fell in the city, resulting in the death of 522 persons and the wounding of 859. The demolition of the fortifications encircling the city was begun in 1919.

Paris, Ontario, a manufacturing town, is on the Grand River and on the Canadian Pacific, Lake Erie & Northern and Grand Trunk railroads, 30 miles west of Hamilton. Paris is the home of one of the largest knitting mills in Canada, and there are factories producing flour, woolens, iron and brass ware, mop wringers and refrigerators. The town is the commercial center for an extensive farming and dairying region. There are three elementary schools, a high school and a library. Population, 1921, 4,365.

Paris Green, a noted insect poison. The active principle is arsenic, but the compound is a green powder composed of copper, arsenic, oxygen, and hydrogen. Eaten by insects it causes their death. In a modified form the mixture has long been used to give paint a vivid green color and in printing the green figures on wallpaper. Europeans knew that it would kill insects, but they made little use of it for that purpose. When the Colorado potato beetle began its ravages in the United States, 1865-70, Dr. Riley of the department of agriculture and other investigators recommended fighting the pest with paris green. Two million pounds are now used annually for that purpose. In use, the powder is first dissolved in water, a half pound or more to the barrel, and is applied as a spray. The fine particles of arsenic lodge on the tender leaves and are eaten by the insects. In an hour or two the potato bugs may drop to the ground dead. Without the aid of paris green the potato raiser would be almost helpless. Paris green and other poisons are used also by fruit growers. See SPRAYING; BORDEAUX MIXTURE; POTATO BEETLE.

Paris, Treaties of, the names applied to seven treaties of peace signed at Paris between the years 1259 and 1898.

TREATY OF 1259. This treaty, though named from Abbeville, was in fact negotiated entirely in Paris between Louis IX of France and Henry III of England. By the treaty Henry dropped his claim to Maine, Anjou, Normandy, Touraine and northern Saintonge; while Louis gave up to Henry, Perigord, southern Saintonge, Limousin and a strip of territory south of the Loire. At the same time Henry relinquished his titles of Count of Anjou and Duke of Normandy.

TREATY OF 1763. This treaty marked the close of the Seven Years' War (which see). The parties to the treaty were France and Spain, on one side, Great Britain and Portugal on the other. France ceded Canada, Prince Edward Island and Cape Breton, and the territory east of the Mississippi River excepting New Orleans, to Great Britain, and Great Britain's claim to Nova Scotia was allowed. France retained the islands of Miquelon and Saint-Pierre as well as a share in the Newfoundland and St. Lawrence fisheries. England restored Martinique and Guadeloupe, and ceded St. Lucia to France, while the latter ceded Senegal, Tobago, Grenade, Dominica and St. Vincent. Spain ceded Florida to Great Britain, and in return received from France Louisiana west of the Mississippi, together with New Orleans. The colonial power of France was greatly weakened by this treaty, while England became dominant in America and India and on the seas.

TREATY OF 1783. The American Union really dates from the signing of this treaty. The independence of the colonies was recognized by Great Britain. To America was secured the territory west to the Mississippi River from a point west of the Lake of the Woods to the thirty-first parallel of north latitude. The Great Lakes and St. Lawrence River to the forty-fifth parallel were recognized as the northern boundary and the southern boundary ran irregularly east to the Atlantic from the thirty-first parallel. The fishing rights of the United States in Newfoundland were retained, and exclusive fishing rights on the Atlantic coast of the United States were granted. The estates of British loyalists, confiscated during the war, were returned to their owners.

TREATY OF 1814. This treaty, drawn after the first abdication of Napoleon, was signed by France, on the one hand, and all the European powers on the other. France gained some territory on the eastern and northern boundaries and the greater part of her colonies were restored. Switzerland was declared independent, and

Italy and Germany each were recognized as independent states. Holland was returned to the House of Orange and Great Britain kept the Cape of Good Hope, a part of Guiana, and Ceylon.

Treaty of 1815. Concluded after the overthrow of Napoleon at Waterloo, this treaty deprived France of the little territory on the north and east gained the previous year. Further, France was forced to pay an indemnity of $200,000,000; and to submit to the occupation of her frontiers by an allied force of 150,000 men, for the maintenance of which she had to pay.

Treaty of 1856. This treaty was concluded among the powers at the close of the Crimean War. It opened the Black Sea to the merchant marine of all nations but closed it to warships, even to those of Turkey and Russia. The Danube was likewise opened and was placed under control of an international commission. Turkey was recognized as independent and Russia gave up Wallachia and Moldavia.

Treaty of 1898. Concluded at the close of the Spanish American War (which see), this treaty secured Spain's evacuation of Cuba and her cession to the United States of Porto Rico, Guam and the Philippine Islands. The United States paid Spain the sum of $20,000,000 for these islands, a very profitable expenditure on which she has realized a large return.

Parish. See Episcopal Church.

Park, Mungo (1771-1806), an African explorer. He was born near Selkirk, Scotland, on the banks of the Yarrow. He was educated at the University of Edinburgh. He was fond of tramping and had a liking for natural history. In 1792 he received an appointment as a medical officer on one of the East India Company's lines plying to Sumatra. He pleased Sir Joseph Banks and other scientific men of Great Britain by bringing home a number of plants and eight fishes new to science. In 1795 he received from the African Association of London a coveted commission to explore Senegambia. He was the first modern European to reach the Niger, a river of which much was heard and nothing known. His privations, adventures, encounters with the lion, hippopotamus, and gorilla, and descriptions of the natives, rivers, and jungles were given to the public in 1799 in a famous volume, *Travels in the Interior of Africa.* It was long a favorite book of adventure and ran through many editions. In 1803 he again set out, this time with a government commission, to trace the Niger to its ultimate source. He ascended the river for over one thousand miles. At the village of Boussa, above Timbuctoo, he fell into a contest with hostile natives. He and his entire party, with the exception of one attendant, were killed or drowned. His name is linked with that of Livingstone, not only as a great explorer, but as a scientific observer as well.

Park, a public ground for recreation. Parks are of several types. The older parks are the grounds of the Old World nobility. Some are of great extent and are almost in a state of nature; many are studded with noble oaks and other forest trees. The grass is cropped by grazing deer. Fish play in the pools and swans nest on artificial islands. Birds are protected, flowers are cultivated, and hedges are trimmed. In others landscape gardening is brought to a fine art. "Royal," "Imperial," are but Old World terms for public. Parks of this sort are as open as American parks. The owners of many estates take pride in making the public welcome. Other owners order their iron gates swung open only on certain days or during the absence of the family, or at such hours as the great family may not desire to walk or ride abroad. Many a so-called owner allows the village urchin to flatten his face against the iron bars, vainly wishing he might reach what was the public common or playground centuries ago.

There are many beautiful city parks on the other side of the Atlantic. Zoölogical collections are a feature. European city teachers make a practice of improving a half holiday by taking their charges to see the animals. Paris has spacious "woods." Stockholm has 33 parks; Moscow, 48; London, 50; Glasgow, 30; Liverpool, 20; Edinburgh, 15; Birmingham, 13; Brussels, 11; Hamburg, 11; Berlin, 83; and even Athens has 2.

Of American cities, New York leads with 6,909 acres of actual park. Philadelphia is second, with 4,044 acres. Other cities having over a thousand acres in trees and

sward and flowers and water are Boston, Chicago, St. Louis, Baltimore, Cleveland, San Francisco, Buffalo, Minneapolis, St. Paul and Milwaukee.

The United States has taken commendable interest in preserving for the people spots noted for their scenery or their historical associations. In 1923 there were twenty-nine national parks under the supervision of the Secretary of the Interior. Facilities for enabling the people to enjoy these national playgrounds are being extended each year.

CANADIAN NATIONAL PARKS AND THEIR RESPECTIVE AREAS

National Park	Area
Banff National Park	2,751 square miles
Brereton Lake	Vacant lands around lake
Brodeur Island Park	20 acres
Buffalo Park	158.75 square miles
Elk Island Park	51 square miles
Falcon Park	Vacant lands around lake
Fort Anne National Park	30 acres
Fort Howe National Park	19 acres
Fort Pelly Park Reserve	800 acres
Jasper National Park	4,400 square miles
Kootenay National Park	587 square miles
Lesser Slave Lake	Vacant lands around lake
Little Manitou Lake	Vacant lands around lake
Mennissawok Antelope Park	17 square miles
Moose Mountain Buffalo Reserve	1,440 acres
Mt. Revelstoke National Park	100 square miles
Nemiskam Antelope Park	8.5 acres
Nora Lake	Vacant lands around lake
Pt. Pelee National Pk.	Vacant lands around lake
St. Lawrence Island Parks	140 acres
Tar Sand Reserve	2,751 square miles
Vidal's Point Park	17.2 acres
Waterton Lakes National Pk.	520 sq. miles
Wawaskesy Antelope Parks	54 square miles
West Hawk Park	Vacant lands around lake
Yoho National Park	Vacant lands around lake

See GLACIER NATIONAL PARK; YELLOWSTONE NATIONAL PARK; YOSEMITE; GRAND CANYON; ROCKY MOUNTAIN NATIONAL PARK.

Parker, Francis Wayland (1837-1902), an American educator. He was born in Bedford, New Hampshire. His early education did not extend beyond the academy, that is, it was equivalent practically to a high school education. He taught school in his native state and in Illinois until the outbreak of the Civil War, when he enlisted with the New Hampshire volunteers. He attained the rank of colonel, but was severely wounded at Deep Bottom, James River. After the war he became principal of the grammar school at Manchester, New Hampshire, and later principal of the high school of Dayton, Ohio. In 1872 he went to Germany to study at Berlin and later received the degree of master of arts from Dartmouth College. He was superintendent of schools in Quincy, Massachusetts, 1875-80, a supervisor of schools at Boston 1880-83, principal of Cook County Normal School, Illinois, 1883-96, principal of Chicago Normal School 1896-99, and then became principal of the Chicago Institute. This became the School of Education of the University of Chicago of which Colonel Parker was director till his death. Colonel Parker published several books on educational matters, the best known among them being *Talks on Teaching, The Practical Teacher, Course in Arithmetic* and *How to Study Geography.*

Parker, Sir Gilbert (1862-), a Canadian author and statesman whose stories of Canadian life have enjoyed wide popularity. He was born in Canada and educated at Trinity College, Toronto. In 1886 he was made associate editor of the Sydney, Australia, *Morning Herald.* While in Australia, Sir Gilbert wrote his first plays. He has traveled in the South Sea Islands, Europe, Asia, Egypt and northern Canada, and in all these countries gathered valuable material for his novels and plays. In 1903 he organized the first Imperial Universities Conference, in London. He represented Gravesend in Parliament from 1900 to 1918. For two and one-half years after England's entrance into the World War Sir Gilbert was in charge of American publicity. His plays are *The Vendetta, No Defence,* and *The Seats of the Mighty.* He published a book of travel sketches entitled *Round the Compass in Australia.* Important among his novels are *Pierre and His People, When Valmond Came to Pontiac, The Pomp of the Lavillettes, An Adventurer of the North, The Lane That Has No Turning, The Money Master, Cumner's Son and Wild Youth and Another.*

Parker, Theodore (1810-1860), a Massachusetts clergyman. He was born in Lexington. He took his degree at Harvard College, studying chiefly at home. In 1837

he accepted the pastorate of the Roxbury Unitarian church. His discourses were of so radical a nature that even the Unitarians, then recently separated from the Congregationalists, looked askance at him. He was never formally expelled from the Unitarian church. He always claimed to be a member of it, but, as a matter of fact, he was for twenty years an independent clergyman and lecturer. His first independent charge was what was known as the Twenty-eighth Congregational Society of Boston. It met in the Melodeon and in the Music Hall. He was one of the most popular preachers in the city. An audience of 3,000 gathered frequently to hear him of a Sunday morning. He was also a favorite public lecturer. He took an active part in the anti-slavery agitation of the day. His name is connected with those of Garrison and Wendell Phillips. He took a personal interest in runaway slaves and openly aided their escape. He was hated thoroughly by the people of the South. He was for a number of years editor of the *Massachusetts Quarterly Review*. He left several volumes of his sermons and other works, including *Historic America* and *Views of Religion*.

Parkersburg, a manufacturing city of West Virginia, situated on the Ohio River, at the mouth of the Little Kanawha, about seventy-five miles southwest of Wheeling. The city is in an agricultural region, while nearby are clay and coal deposits, petroleum wells, natural gas wells, and mineral springs. The chief industry is oil refining, but there are several manufactories, their products including flour, chemicals, pottery, glass, furniture, boilers, and lumber. There are also machine shops, foundries, breweries, and veneer works. The Burlington and Ohio and other railroads serve the city, and there is steamboat communication with other river ports on the Ohio. There is a government building, a city hall, and a court house. Beside the public schools the Academy of Visitation and the Washington High School are located in Parkersburg, also a hospital and a public library. The population in 1920 was 20,050.

Parkhurst, Charles Henry (1842-), an American Presbyterian clergyman. His birthplace was Framingham, Massachusetts, and his early education was acquired in his native state. He was graduated from Amherst in 1866, going abroad later to study theology at Halle and at Leipsic. Returning to America, he taught in Williston Seminary for a time and in 1874 became pastor of the Congregational Church of Lenox, Massachusetts. Six years later he accepted the pastorate of the Madison Square Presbyterian Church of New York City. He began almost immediately to study the problem of crime in New York and was made president of the Society for the Prevention of Crime. He was influential in bringing about the Lexow Investigation of the charge that the New York police were in league with criminals. Of striking personality and strong character, in his preaching, positive, epigrammatic, intensely practical and absolutely fearless, Dr. Parkhurst became one of the foremost preachers of his time. The same qualities of practical earnestness and fearlessness made effective his work as a reformer.

Dr. Parkhurst is the author of several books, among them, *The Blind Man's Creed, The Pattern on the Mount, What Would the World Be Without Religion, Our Fight with Tammany, The Sunny Side of Christianity*.

Parkin, Sir George Robert (1846-1922), a Canadian educator and author, was born at Salisbury, New Brunswick, and studied at the University of New Brunswick and at Oxford University, England. Dr. Parkin entered the teaching profession and was principal of the College School, Fredericton, for several years. During this period he began to take an active interest in the question dealt with in some of his best books—imperial federation. In 1895 he was chosen principal of Upper Canada College, serving that institution until 1902. In the latter year he went to England as organizing representative of the scholarship trust founded by Cecil Rhodes. He was knighted in 1920 and retired from the Rhodes Scholarship Trust in 1921. (See RHODES, CECIL). Among his published works are *Imperial Federation, The Great Dominion, Round the Empire, Life and Letters of Edward Thring* and *Life of Sir John A. Macdonald*.

Parkman, Francis (1823-1893), an eminent American historian. He was a Boston boy of good family. As a child he was fond of stories of the early settlement of New England. When a Harvard sophomore he formed the purpose of writing a history of the French and Indian War. The possession of family wealth enabled young Parkman to form his plans and to carry them out in his own way. He spent his vacations in camping and canoeing. His "postgraduate course" he took with a cousin among the Dakota Indians in the Black Hills. After his return he wrote his first volume, *The Oregon Trail,* a vivid account of the tents, villages, feasts, buffalo hunts, and filthy habits of the Dakota Indians. However, the trip with its accompanying hardships proved too strenuous for his very weak constitution, and it is at that time that his health began to fail. All the rest of his life he was a semi-invalid, but he continued with his work as regularly as possible, and accomplished a great deal in spite of his sickness.

He made five trips to Europe to explore French and Indian archives, and visited every important American locality that his historical work led him to describe. The *Conspiracy of Pontiac, The Jesuits in North America, The Discovery of the Great West,* and *Montcalm and Wolfe* are perhaps his most important volumes. Parkman gave his life to a study of the Jesuits and their great work in the exploration and settlement of Canada and the region about the Great Lakes. It is not likely that any other writer will ever bring to the history of this period so extensive a knowledge of the facts, coupled with so brilliant a literary imagination. Parkman's volumes are a treasure-house, and should be read by every boy who is fond of American history. Even while he was accomplishing so much, his health continued to become worse constantly, until his eyes as well became afflicted. At the time of his death he was nearly blind.

See BUFFALO; PONTIAC; JESUITS; MARQUETTE; LA SALLE.

Parliament, pär'lĭ-ment, the representative body of the English government. It consists of two houses, the Lords and the Commons. The House of Lords consists of English, Scottish, and Irish peers. The English peers inherit their seats or receive them by appointment of the sovereigns, or else they hold their seats by virtue of offices, as in the case of the bishops of the English Church. Sixteen representatives of the Scottish peerage are elected by the Scottish peers to serve during the duration of the Parliament. Twenty-eight representatives are elected for life by the peers of Ireland. The present membership of the upper house is given as 728 members. It is presided over by the lord chancellor of England.

The House of Commons consists of members sent up by the various electoral districts of the United Kingdom. The House is presided over by a speaker. Only householders and people of some property are allowed to vote. Paupers are excluded from the polls. No clergyman of the Church of England or of the Roman Catholic church or the Church of Scotland may serve in the House of Commons. Certain judicial officers, known in Great Britain as sheriffs, and others connected with the elections are disqualified from election as members of the lower house. According to the act of 1918 there are 492 English members, thirty-six Welsh members, seventy-four Scottish members, and 105 Irish members, or 707 in all. Among these members are a certain number chosen by the various universities. Members of the Commons receive no salary.

As in the Congress of the United States, bills for revenue must originate in the lower house. Money bills may be rejected by the House of Lords, but may not be amended. The House of Lords stands in fear of the authority of the king to secure a majority at any time by the creation of new peers. The House of Commons is the real power in Parliament. During the struggle over the great Reform Bill of 1832, when the Duke of Wellington was unable to form a ministry and Earl Grey refused to resume office except on condition the bill should pass, the king was obliged to sign a bit of paper still to be seen in the British Museum: "The king grants permission to Earl Grey (the head of the ministry) to create such a number of new peers as will insure the passage of the Reform

Bill." This struggle established certain definite facts regarding the mutual relations of the Lords, Commons, and Cabinet: 1. That the Commons are the real power in Parliament. 2. That the Lords may retard but cannot prevent legislation; if a measure which has passed the Commons and been defeated by the Lords, is again passed by the Commons after an appeal to the country, the Lords must yield. 3. That the cabinet is the ministry of the Commons and not of the king.

A Parliament once elected remains in office for seven years, or until it is dissolved by the ministry. There were fifteen Parliaments during the reign of Queen Victoria. The first was elected in 1837 and remained in office until 1841. Others served from six years to six months. When a Parliament has been dissolved, an election is ordered in the name of the sovereign but really by the ministry. The adjournments of Parliament from time to time are called recesses. To fill a vacancy, a writ for the election of a new member is issued on motion of the House. In case of a vacancy occurring during a recess a writ is issued by the speaker.

The English Parliament grew out of an Anglo-Saxon assembly, the Witenagemot, or meeting of the wise men. Under the Norman kings it began to do its work in sections, or large committees, in order to facilitate business. In the thirteenth century representatives of counties and towns were added to the "lords" who previously had composed the body. During the fourteenth century, in the reign of Edward III, Parliament was divided into two houses, the House of Lords, including the lords spiritual and the lords temporal, and the House of Commons, including knights, citizens and burgesses. The year in which the two houses began to sit separately is not known. In 1707 the Parliament of Scotland was united with that of England. In 1800 a parliamentary union with Ireland took place.

Early in the nineteenth century a cry for reform both in voting and representation went up. A number of districts, called "rotten boroughs," had lost their population; while Manchester, Birmingham, and other large manufacturing towns were without representation. Old Sarum, for instance, contained but the ruins of a castle, yet its owner was permitted to name two members of Parliament. Reform bills were passed in 1832, 1867, and again in 1884.

The British Parliament meets in an edifice known as the House of Parliament. It stands on the left bank of the Thames, between Westminster Abbey and the river. It covers an area of eight acres. The river front is 900 feet in length. The building is of brick, faced externally with limestone. A terrace of Aberdeen granite leads down to the river. The building is of the style known to architects as Tudor-Gothic. Victoria Tower, at the southwest angle, is 340 feet in height. A central tower is 300 feet high. The clock tower at the north end of the edifice is 320 feet high. The House of Peers is the most richly decorated chamber in the building. It is adorned with statues and armorial bearings of the kings, queens, and nobility of England from the time of the Conquest to the present day. The main room is ninety-seven feet long, forty-five feet wide, and forty-five feet high. It is paneled with carved oak and ornamented with a profusion of gilding, fresco paintings, and richly stained glass.

CANADA. The Parliament of Canada corresponds closely to that of the British Isles, but in Canada the upper house is known as the Senate. Members of the Senate are nominated for life; they number 96, and at no time may they number more than 104. The members of the House of Commons are elected by the people and number 235.

Parliamentary Law, the body of rules and precedents under which clubs, debating societies, legislatures, and other deliberative bodies conduct their meetings. Such rules of procedure are necessary to accomplish the purposes of the club, literary society, or other body employing them, and have been embodied in a definite code. The following list, taken from Mrs. Emma A. Fox's book, *Parliamentary Usage for Women's Clubs,* gives a concise statement of the principles of parliamentary law:

1. Justice to all.
2. Courtesy to all.
3. One at a time.

4. The rule of the majority.
5. The rights of the minority.

It is the duty of the presiding officer at a meeting to see that the members conform to the usages of parliamentary law. The book mentioned above gives the rules of order for women's organizations in a very clear and definite manner. Robert's *Rules of Order* is a standard general manual.

As a general thing, a club has the following officers: President, who presides over the meeting and conducts the discussion; vice president, who takes charge of the meeting in the absence of the president; corresponding and recording secretaries, whose duties are to send out the notices to members and make a record of the events of the meeting, respectively, and the treasurer, whose business it is to render an accounting of the moneys of the society.

Matters requiring special investigation or attention are generally placed in the hands of committees, appointed by the president. Thus there are committees on membership, social affairs, by-laws, procedure and special entertainments.

Parlow, [Mary] Kathleen (1890-), a Canadian violinist, one of the few women who have mastered a very difficult instrument, was born at Calgary, Alberta. When she was five years old her parents moved to San Francisco. Here she studied under Holmes, an English violinist who, because his pupil's progress was so rapid, took her to London in 1905 and exhibited her as a child prodigy. Miss Parlow soon tired of these exhibitions and it seemed for a time that she would never play again. Her love of music revived after she heard for the first time the great Jewish violinist, Mischa Elman, and she went to Petrograd to study under Elman's teacher, Leopold Auer. After eighteen months of hard work she made her debut in Petrograd as a finished artist and was eminently successful. In 1910 she made her first tour of the United States, again triumphing. From the superficial, clever child musician had developed the mature artist. She has toured Canada and has given recitals in many European capitals.

Parnassus, a mountain ridge of Greece, eighty miles northwest of Athens. Its highest summit is 8,068 feet above sea level. The oracle of Delphi was situated near its southern base. In Greek legend Parnassus was the home of Apollo, the muses, and the nymphs, hence the source of inspiration for music and poetry. A painting in the Louvre, Paris, represents Apollo as playing, while the muses dance. Mercury stands beside Pegasus, the winged horse of the muses. Venus and Mars stand on an elevation with Cupid, who is in the act of shooting arrows into Vulcan's cave. Allusions to Parnassus are frequent in literature. Emerson compiled a volume of choice verse, which he called *Parnassus.* In the *Fable for Critics,* Lowell speaks of himself:

> There is Lowell, who's striving Parnassus to climb,
> With a whole bale of isms tied together with rhyme.

Parnell, Charles Stewart (1846-1891), an Irish statesman. He was born at Avondale, in County Wicklow. He was educated at Cambridge but left without a degree. He entered Parliament in 1875 and soon became known as an obstructionist. In 1879 he was made president of the newly-established Land League. He opposed the Crimes Bill and the Arms Bill, and as a result of his violent assertions of opposition to the Gladstone forces he lost his seat and was imprisoned for six months in the Kilmainham jail. In 1886 he declared himself in sympathy with Gladstone's Home Rule Bill, and after its rejection Gladstone and Parnell remained in close political alliance. The following year the London *Times* charged him with complicity in the crimes committed by the extreme section of the Irish Nationalist party. After a trial of 128 days Parnell was acquitted, and he received £5,000 in his suit for damages on the charge of libel. Later he lost his popularity by becoming involved in a divorce scandal, and his political career came to an end rather abruptly, despite repeated efforts on his part to remain in the position of trust and power to which he had once attained.

Parody, a humorous composition which in form, style, and expression imitates some serious literary production, but which treats of a subject comparatively light and trivial. To be effective the production im-

itated must be thoroughly well-known. The word parody is from the Greek, the rhapsodists being accustomed, in reciting the *Iliad* and the *Odyssey,* to throw in occasionally some parody of their own imitating the style and meter of the Homeric verse. Aristophanes was the master of parody among the ancients, closely followed by Lucian who used Homeric language freely in his *Dialogues of the Gods.* Cicero in his *De Oratore,* mentions several kinds of parody, showing it to have been a favorite form among the Romans. During the period of the Reformation the Bible and the liturgy of the Christian church, hymns, prayers, mass, creed, and litany were parodied repeatedly, although many a man found himself in serious difficulty by reason of publishing such writings. Shakespeare parodied and was parodied by his contemporaries. Wordsworth, Keats, Shelley, Tennyson, Browning, and many another among England's famous writers have been ridiculed in parodies. C. S. Calverly has won the greatest reputation, probably, of any writer of parodies in poetical form. His imitations of Tennyson's *Brook* and Browning's *Ring and the Book* are worthy of special note.

In prose, also, many parodies have appeared. Fielding's *Joseph Andrews* was in reality a parody of Richardson's *Pamela. Rejected Addresses* by James and Horace Smith are probably the most famous of all English parodies.

In America the parody has been popular. Richard Grant White in his *New Gospel of Peace* has produced, perhaps, the most worthy. Bret Harte in *Condensed Novels* has parodied both the older and the later English novelists. Bayard Taylor, D. R. Locke, R. H. Newell, Robert J. Burdette, H. C. Bunner and Carolyn Wells are popular writers of parodies.

Parrakeet, păr′ra-kēt′, or **Paroquet,** păr′ō-kĕt′, a bird distinguished from the larger and better-known species of parrots by its small size and form and by its long wedge-shaped tail. Its colors are flashing green on the body, red on the cheeks, and yellow on the head and neck. These birds are clever talkers and are inclined to be noisy. The Carolina parrakeet was formerly found throughout the eastern half of this country, but of late years it is restricted to Florida and is no longer found in great numbers there. Its tameness and its constant chattering are said to be factors which have hastened the extinction of this bird in the United States.

Parrhasius, par-rā′shĭ-us (about 470-400 B. C.), a Grecian painter. Celebrated for wealth, insolence, and ability. He is said to have outmatched his rival, Zeuxis, by painting a picture of a curtain. Zeuxis came to see the picture and was so deceived by its naturalness that he waited for the curtain to be drawn aside that he might view the painting. Parrhasius is accused, probably unjustly, of crucifying a prisoner to get the real expression of pain for a picture he was painting.

Parrot, a family of birds, remarkable for brilliant plumage and a power of imitating human speech. They live in tropical forests, eating seeds and fruit. The parrot is a poor walker but it is a strong flier. It can climb almost as well as a woodpecker, an operation in which it assists itself by clinging to vines and branches with its strong hooked bill. Of 500 species about 150 are inhabitants of tropical America. One species, the Carolina paroquet, formerly ranged from Colorado and the Great Lakes to the Gulf, but the demand for its green and gold wings, as well as its propensity for fruit, has confined it to the wilder parts of Oklahoma and Florida.

The largest parrot is the Central American macaw, whose depredations are dreaded by proprietors of orchards and cornfields. The scarlet macaw is a brilliant bird about three feet in length. The green macaw and the blue and the yellow macaw are somewhat smaller. They are all poor talkers, limited to a few phrases, but are favorite cage birds on account of their plumage. The smallest parrots are hardly as large as a red-winged blackbird. The best talker is the red-tailed gray parrot of Africa. It can be taught to repeat the Lord's Prayer and the Apostles' Creed. The second place is claimed by the yellow-headed parrot of Mexico.

Formerly a rare gift bestowed by a returning sailor, parrots are now to be had of bird dealers in every considerable city.

In the bird stores of New York they fetch from $5 to $15 each. Parrots constitute the most intelligent family of birds, displaying a sense of humor, and no little degree of affection, but they are changeable and quick tempered. It is said that the parrot's tongue is much like that of a person.

The parrot nests in a hollow tree, several pairs usually occupying the same cavity. If a few parrots be killed or wounded by discharging a gun, the other birds of the flock take flight, but circle back and settle down with every evidence of sympathy and concern for their unfortunate comrades. This affectionate trait facilitates their rapid extermination at the hands of the fowler.

The gray parrot has been known to live to an age of seventy years. In perching, the parrot directs two toes forward and two backward. Contrary to the fruit-eating habits of the family, the kea parrot of New Zealand has a liking for flesh, fresh mutton preferred. It is accused of killing sheep for its own consumption.

Parry, William Edward (1790-1855), an English Arctic explorer. He was the son of a physician of Bath and was educated in the grammar school of that place. He went to sea as a midshipman when a mere youth. He was a member of the John Ross expedition in search of a northwest passage to the Pacific. On his return he was made commander of two ships and set out on the same mission. He made three trips to the region westward of Greenland. On one of these trips he reached Melville Islands and crossed the 110th meridian of west longitude. He received a standing reward of $25,000 which had been offered to any navigator who should accomplish this feat. Parry also attempted to reach the north pole by way of Spitzbergen. He expected to find a solid body of ice on which to travel with sledges, but was disappointed. The most northerly point reached by him was 82° 45′ north latitude. On retiring from the sea, he was knighted and received a comfortable position in the government service in connection with the making of sea charts. He wrote several books descriptive of his voyages. His name has been given to the Parry Islands, an archipelago in which Melville and neighboring islands are included. See ARCTIC REGIONS.

Parry Sound, Ontario, a town on the eastern shore of Georgian Bay, at the point where the Sequin River flows into Parry Sound. It is served by lake steamers and by the Canadian Pacific, the Canadian Northern and the Grand Trunk railroads. Hydro-electric power is furnished to manufacturers of chemicals, furniture polish, buttons, spools, boats and finished lumber. The forests of the vicinity furnish pine, hemlock and various hardwoods. Parry Sound is a favorite resort of fishermen and big game hunters. It has good schools and a public library. Population, 1921, 3,546.

Parsboro, Nova Scotia, a port on the north shore of the Basin of Minas and on the Cumberland Railroad & Coal Company Railroad, 32 miles south of Spring Hill. The town has a good harbor, and its chief importance is as a coal and lumber shipping point. There are shipyards and woodworking mills. The building of wooden ships was once the great industry of Parsboro, before the era of steam and iron, and Parsboro ships were on every ocean. The schools are good and the public utilities are the property of the municipality. Population in 1921, 2,748.

Parsees, pär′sēz, a remnant of ancient Persians, followers of Zoroaster. The name is a corruption of Parsis, meaning Persians. The religion of Zoroaster was the national creed of Persia at the time of Alexander the Great and continued to flourish until the Persians were subdued by the Caliph Omar, 651 A. D. The great bulk of the Persians were converted by sword to Mohammedanism. A few thousands hid themselves away in the mountain fastnesses of the country. Their descendants, known as Guebres, still live in Persia, particularly in the city of Teheran. Many fugitives found their way to southern Asia, where their descendants, called Parsees, form colonies at Calcutta, Madras and Aden.

See ZOROASTER; MAGI; FIRE WORSHIPERS; JEJEEBHOY.

Parsifal, pär′sē-fäl, an opera by Richard Wagner. The drama is founded on a story of Perceval or Parsifal of the Arthurian cycle. Wolfram von Eschenbach told the legend in an epic poem entitled *Parzival,* written in the early part of the thirteenth century. It was based probably on

a French epic by Christian de Troyes of the twelfth century, although the story had appeared in several prose forms. From the French it passed into the literature of nearly every European nation. The story runs that Parzival's father fell in battle, and, to avoid a like fate for her child, his mother brought him up in the forest in ignorance of knightly customs. After many adventures, he reached Arthur's court and became a knight of the Round Table. He then renounced his allegiance to God and wandered away, but at last, learning the true nature of God and of the Grail, he was purified and restored to his place as a knight of the Round Table. Wagner's drama, somewhat changed from this old story, was written in German in 1877. The music was composed in 1879.

Parsnip, a well known garden vegetable. It is a native of Europe, but is raised in all temperate climates. It is biennial. It produces a carrot-shaped root one year and seed the next year. It is a robust-growing plant, sending up a strong, grooved, hollow stem. It produces an umbel of small flowers, succeeded by thin, flat seeds. When allowed to run wild the parsnip ceases to produce a spindle-shaped root, and not infrequently seeds the first year. Parsnips are used for the table and for feeding stock. There are several wild plants of the name. See VEGETABLES.

Parsons, Kans., an industrial city in Labette County, is on the Neosho River and the St. Louis & San Francisco and Missouri, Kansas & Texas railroads, and interurban lines, 137 miles southwest of Kansas city. The manufactures include boilers, brass and iron ware, flour, grist, clothing and stock food. The city contains numerous grain elevators, nurseries and creameries, and is in the midst of a rich farming district. Natural gas, coal and oil are found near the city.

The most notable features of Parsons are the municipal building, Federal building, Carnegie library, Mercy Hospital, State Hospital for Epileptics, Glenwood and Forest parks, railroad Y. M. C. A. and the Masonic Temple. Parsons has been governed under a modified commission form of government since 1911. The population was 16,028 in 1920.

Parson's Cause. See HENRY, PATRICK.

Parthenon, pär'the-non, a temple in honor of Athena Parthenos. The word means the Virgin. The Parthenon was the chief temple of Athens, the most noted temple of antiquity. It stood on the Athenian Acropolis. The foundation was of limestone. The temple itself was wholly of marble. It rested on a rectangle of marble drawn in on all sides by three steps. The temple proper was 228 feet long, 100 feet wide, and 66 feet high. The architecture was Doric, the severest and the most chaste of the three Grecian styles. A lofty porch ran around the entire building. It was supported on a double row of pillars thirty-four feet in height. These pillars were six feet in diameter at the base and narrowed slightly as they rose. The outer row contained forty pillars, eight across each end and seventeen on a side. The frieze and gables were formed of richly carved marble slabs. From traces of color still left, it is known that rich paints—Tyrian purple, red, and blue—were employed to color the ornamental portion of the edifice. The interior was sacred to Athena and sheltered a statue of that goddess, the masterpiece of Phidias.

The general outline of the Parthenon was broad and flat, not unlike a barn, every line straight. There were no spires or projections of any kind; and yet it is regarded as the most perfect structure yet erected by man. Richness of material, faultlessness of sculpture, and the color scheme employed added charm, but the real beauty of the building lies in its massive simplicity and in the harmony of proportion. Width, length, and height combine to please the eye. The pillars are of the diameter, distance apart, and height to produce a pleasing effect. The belt of stonework resting on the pillars seems almost musical in the happy proportion of massiveness, width, and grace. The roof stands just right, rising beyond criticism. The groups of sculpture seem to fit naturally into their places, square in the frieze and triangular in the gables. There is no cramping of figures, straining of material, or overloading of stone anywhere. The general effect upon the eye is pleasing beyond all description. Whether the traveler ap-

proach by boat or by rail, his first glimpse of Athens is of the Acropolis crowned by the remains of the Parthenon, beautiful still and inspiring. See ATHENS; ATHENA; PHIDIAS; ELGIN MARBLES; ACROPOLIS.

Partington, Mrs., the heroine of a book by Benjamin Penhallow Shillaber, entitled *Life and Sayings of Mrs. Partington,* and published in 1854. Mr. Shillaber, who was a native of New Hampshire, was at one time editor of the Boston *Post,* at another, editor-in-chief of the *Carpet Bag,* and still later editor of the *Saturday Evening Gazette.* He also published *Mrs. Partington's Knitting Work* and *Partingtonian Patchwork.* While these writings display no special literary merit, they are full of homely good sense and a certain kind of humor which made them popular.

Partnership, a contract between two or more persons who agree to undertake conjointly a lawful business with a view to sharing profits and losses. Partnerships are generally formed by written contract or by oral agreement. The rules which govern a contract of partnership correspond to those governing contracts in general. A partner may be secret and conceal from the public his relations with the firm; silent, taking no active part in the control of the business but receiving his quota of the profits; special, becoming a member under legal limitation of some kind or other; and liquidating, taking charge of the business of a partnership after the firm has dissolved. The power rests as a rule with the majority, but the rights of the minority or the individual must be respected. Partners are liable to one another and must preserve relations of absolute good faith. On the other hand, the firm is bound by the act of any partner acting as such.

Partnership may be dissolved or modified at the will of all members. If a partnership is dissolved the firm is still responsible for the existing debts, but new ones can no longer be contracted. If a partner dies, the business is controlled by the survivors only long enough to enable them to close the partnership, and when the affairs are settled the amount due the heirs or representatives of the deceased must be paid. If the business continues after this change has been effected, it is resumed as a new firm.

The existence of a partnership involves many questions of law, and while it has been defined in various ways, the final settlement of disputed points is often a matter to be settled by the higher courts. Disputes between the partners themselves are referred to courts of equity for litigation and not to courts of law.

Partridge, pär′trĭj, a familiar bird of the grouse family. The term is applied also to the quail, but it belongs of right to the ruffed grouse. In the South, the ruffed grouse is called a pheasant; in New England, a partridge. The ruff consists of two tufts of broad, glossy black feathers, one on each side of the neck. The partridge is found in wooded districts from the Mississippi Valley to the mountains of Georgia and northeastward into Canada. In the spring the male mounts a log or stump and drums by striking its sides with its wings. The thumps are deliberate at first, but come faster and faster, ending in a prolonged vibration. This drumming is well described by Chapman: "This loud tattoo begins with the measured thump of the big drum, then gradually changes and dies away in the rumble of the kettledrum. It may be briefly represented thus: *Thump — thump — thump—thump, thump; thump, thump-rup, rup rup rup r-r-r-r-r-r-r-r-r.*

The partridge lays from eight to fourteen eggs in a well built nest beneath a bush, or at the foot of a tree. The young follow their mother a few hours after hatching, and are so lively, that "to run like a partridge" has become a proverbial expression. Many a boy walking in the woods has come across a partridge with a broken wing which, however, seemed to mend rapidly, as he chased her, until finally, and to his utter astonishment, she sailed away with perfect ease, while he perhaps lived to learn later in life that he had been deceived by a ruse of the affectionate mother designed to lure him from the vicinity of her covey.

During the summer the partridge feeds her young on insects and grubs. In the autumn the entire family dine on small fruit. In winter, buds and seeds, especially sumach berries and dwarf birch buds.

are articles of diet. The toes of the partridge are furnished with horny flanges which, like snowshoes, enable the owner to walk on soft snow. The partridge roosts habitually in evergreen and alder thickets, but, like the prairie hen, is quite capable, in the North at least, of taking refuge over night in a soft snow drift.

The sharp-rayed track of the partridge adds another figure to this fantastic embroidery upon the winter snow, . . . leading you over logs and through brush, alert and expectant, till, suddenly, she bursts up a few yards from you, and goes humming through the trees—the complete triumph of endurance and vigor. Hardy native bird, may your tracks never be fewer, or your visits to the birch-tree less frequent!—Burroughs.

I listened, and from midst the depth of woods
Heard the love-signal of the grouse, that wears
A sable ruff around his mottled neck;
Partridge they call him by our northern streams,
And pheasant by the Delaware. He beat
His barred sides with his speckled wings, and made
A sound like distant thunder; slow the strokes
At first, then fast and faster, till at length
They passed into a murmur and were still.
—Bryant, *The Old Man's Counsel.*

Partridge Berry. See WINTERGREEN.

Pasadena, Cal., a famous health and winter resort, is situated nine miles northeast of Los Angeles, and twenty miles from the Pacific Ocean. It is served by the Southern Pacific, the Atchison, Topeka & Santa Fe, and other railroads. This beautiful city was settled in 1874 by a colony of people from Indianapolis, Ind. These people planted the first orchards here. The preparation of the fruits—lemons, oranges, etc.—for the market is the principal industry of the city. There are extensive drying establishments, packing houses and canning factories. Other industrial plants are cut glass works, flour mills, brick works and boot and shoe factories.

The city has many fine hotels, and features of interest are the Carnegie Solar Observatory, on Mount Wilson, the San Gabriel Mission and the Busch Sunken Gardens. There are many public and private schools and a Carnegie library. Population in 1920, 45,334.

Pascal, păs-kal, **Blaise** (1623-1662), a French mathematician and physicist. As a child he was precocious, at the age of twelve having worked out independently most of the propositions of plane geometry, as well as having prepared a treatise on acoustics. Before he was sixteen he had worked out the fundamentals of conic sections, which persist with but little change in our modern treatment of the subject. The following years were marked by his invention of a calculating machine and that series of experiments which led to the so-called Pascal's law, familiar to the student of elementary physics, that pressure exerted upon an enclosed liquid is transmitted with undiminished force upon every equal area of the interior of the containing vessel.

His most important literary work is his "Thoughts on Religion," but his claim upon our attention today rests mainly upon achievements of physics and mathematics.

Passaic, N. J., an industrial city, is at the head of navigation on The Passaic River, 13 miles northwest of New York City. It is served by the Erie and the Delaware, Lackawanna & Western railroads. This city has a beautiful residential section with paved and shaded streets and handsome homes. Water power developed from the river is furnished to plants producing woolen, cotton and silk goods, rubber goods, chemicals, leather, handkerchiefs, metal goods and belting. It contains several parks, a high school, public, graded, and parochial schools and a large public library. In 1920 the poulation was 63,824.

Passion Flower, an interesting genus of herbs and trees, chiefly South American, bearing curious flowers which the early Spanish and Italian travelers fancied were emblematical of Christ's suffering or "passion." We quote Bailey:

The ten colored parts of the floral envelope were thought to represent the ten apostles present at the crucifixion, Peter and Judas being absent. Inside the corolla is a showy crown or corona of colored filaments or fringes, taken to represent the crown of thorns, or by some thought to be emblematic of the halo. The stamens are five, to some suggestive of the five wounds, by others thought to be emblematic of the hammers which were used to drive the three nails, the latter being represented by the three styles with capitate stigmas. The long axillary coiling tendrils represented the cords or the scourges. The digitate leaves suggested the hands of the persecutors.

Passion Play, a form of Mystery Play representing the life and death of Christ.

It was extremely popular in the Middle Ages when Mystery Plays were in vogue. It was considered especially appropriate for presentation during Holy Week. After the Reformation such plays ceased to be presented in Germany among Protestants, but were kept up in the Roman Catholic communities of Bavaria, the Tyrol, and the Salzburg Alps. In the eighteenth century they were forbidden by the Bavarian government, an exception being made in the case of the village of Oberammergau, whose inhabitants still present the play every ten years. The Passion Play at Oberammergau does not seem to be a survival of the old Mystery Plays, however, but is a solemn act of religious worship. The custom was instituted in 1633, as the result of a vow. The villagers had escaped a plague raging in the neighborhood, and in consequence vowed to celebrate this festival once in ten years. The performance takes place on the Sundays and saints' days of summer in an open air theater holding about 6,000 persons. If the "pilgrims," as the spectators are called, exceed in number the capacity of the theater, the play is repeated on Monday. On days when the play is to be presented the performers attend special mass soon after daybreak, and about six in the morning another mass is read for the "pilgrims," none of whom must behold the spectacle without this ceremony. Protestants, too, intending to be present, receive the communion. One instance is told of a group of Protestants renting a barn, since no other place offered. They gathered on the hay in the loft and received the sacrament before witnessing the sacred scenes of the Passion Play.

The play occupies about nine hours. Before each scene a tableau of appropriate significance from the Old Testament is shown. Between 600 and 700 persons, all residents of the village, are engaged in its presentation. The principal parts are hereditary in certain families. To act the part of Christ is considered one of the greatest of earthly honors. The man who plays it must lead a pure and blameless life lest he dishonor his great office. Anton Lang has taken the part several times, including the presentation of 1910. It is said that the natural poetic temperament of the man has been emphasized by a deep realization of what he believes to be the greatest of earthly honors. Many claim that his face has come to bear a resemblance in features and expression to the pictured face of Christ.

The artistic temperament of these people, their deep religious fervor, the earnestness with which preparation is made for the performance, and the reverence with which it is regarded, unite to make the Passion Play a most interesting and impressive spectacle. People from all nations come to see it.

Passover, an annual feast of the Jews. It falls on the first full moon of the spring, about Easter time. It is a feast of thankfulness, corresponding in a way to the American Thanksgiving. It was instituted to commemorate the escape of the Hebrews in Egypt, when the Lord, smiting the first born of the Egyptians, "passed over" the homes of the Israelites, the doorways of which were marked with the blood of the pascal lamb. The Israelites were directed to eat the first Passover with their loins girded, shoes on their feet, and staffs in their hands. "And ye shall observe this thing for an ordinance to thee and thy sons together. And it shall come to pass when your children shall say unto you, what mean we by this service? that ye shall say, It is the sacrifice of the Lord's passover, who passed over the houses of the children of Israel in Egypt, when he smote the Egyptians."

The term came to include the entire week in which unleavened bread is eaten. In this sense, it is synonymous with the feast of unleavened bread. When settled in Canaan, the feast of the Passover was celebrated at Jerusalem. All who were able to leave home came up to the temple. Josephus tells us that, in the year 65 A. D., 3,000,000 Jews visited Jerusalem to eat the feast of the Passover. A quarter of a million lambs were required. The city could not hold the multitude. Tents were erected without the walls. This festival was the great event of the year. It reminds the reader of the annual pilgrimage to Mecca still enjoyed by the Arabs, a kindred people. The festival of the Passover is now celebrated widely in the home, like the American Thanksgiving.

Passport, a document issued by competent civil authority, granting permission to the person specified in it to travel, or certifying his right to protection. In some countries no person is allowed to pass the frontiers without a passport from his government, but the regulations of different countries regarding the use of passports have varied much in the past, and before the World War had shown a tendency toward a relaxation of their stringency, extending in many countries to their total abolition.

Passport regulations in the United States were comparatively simple up to the year 1917, being issued to citizens upon application to the State Department at Washington, upon an affidavit as to place of birth, age, etc., supported by the certificate of one other citizen and payment of a fee of $1. Owing to the war, the State Department was obliged in June, 1917, to institute stricter regulations governing the issue of passports. Applicants were required to send in their applications so long in advance as to permit them to be held in the department one week, if deemed necessary, for examination. It was also announced that during the continuation of the war passports would not be issued to naturalized American citizens within a period of six months after they obtained naturalization, except in cases of extraordinary emergency; and such exceptions were not to be made in cases of persons desiring to go abroad on commercial business. This regulation was changed in 1918 to permit the issue of passports upon a showing of "reasonable necessity" for departure from the country.

Passports are now (1923) being issued by the Secretary of State to American citizens traveling on business or for pleasure to all parts of the world except countries where internal conditions or relations with the United States prevent. Passports are not required by American citizens going to Canada, the Hawaiian Islands, Porto Rico, Newfoundland, St. Pierre-Miquelon, Bermuda, Bimini, the Bahamas or the Phillippine Islands, if going direct.

No one but the Secretary of State may grant and issue passports in the United States, and he is empowered to refuse them in his discretion. Passports are not issued by American diplomatic and consular officers abroad except in cases of emergency; and a citizen who is abroad and desires to procure a passport must apply therefor through the nearest diplomatic or consular officer to the Secretary of State.

A fee of $10 is required to be collected for every citizen's passport issued, and that amount must accompany the application. No fees are charged the widow, child, parent, brother or sister of an American soldier, sailor or marine buried abroad, to visit the country of burial.

Application for a passport must be made in person, in the form of an affidavit, in duplicate, for which blanks may be obtained from the State Department, clerks of courts authorized to naturalize aliens, or designated agents of the Secretary of State. Applicants must submit evidence of American citizenship; if born in the United States (a) either a copy of birth certificate, or (b) a sworn affidavit by a relative as to the date and place of birth, or (c) an affidavit by a friend who has known the applicant at least fifteen years and can make the statement under oath that, to the best of his knowledge and belief, applicant was born in the United States, giving date and place of birth. If a naturalized citizen, the certificate of naturalization or a copy thereof must be exhibited.

Every applicant must be accompanied by an identifying witness who is an American citizen and who, under oath, can identify him as the person he represents himself to be. This witness must be a person established in a recognized business or profession and having his office or place of business within the jurisdiction of the court or the State Department's agent; for example, a clergyman, lawyer, physician, banker, broker, real estate dealer or merchant. A passport previously issued by the Secretary of State, dated on or after June 3, 1918, bearing the photograph and signature of the person to whom the passport was originally issued, will be accepted in lieu of an identifying witness for the same person.

The applicant must state from what point he intends to leave the United States, the object of his trip and evidence of same, the date of his intended departure, and also, if from a port of the United States, by what ship he intends to sail.

A person applying for a passport, renewal of his passport, or an amendment thereto to include additional countries, should state in a brief form the object or objects of his proposed trip abroad, but it is no longer necessary to submit with the application documentary evidence supporting the statements as to the objects of the trip. If there is more than one object of the trip, each should be clearly stated opposite the name of the country in which it is intended to accomplish the objects. These objects may be stated briefly. as study, health, tourist, recreation, temporary residence, settling an estate, caring for personal property, visiting relatives, etc.; or commercial business, relief, distribution of funds, ets.

Each application for a passport must be accompanied by duplicate photographs of the applicant, on thin paper, unmounted, and not larger in size than 3 by 3 inches. One must be attached to the back of the application by the clerk of court or department's agent before whom the application is made, and is stamped with his seal; the other, signed across its face by the applicant, must be sent loose to be attached to the passport by the State Department.

A passport is valid for twelve months from the date of its issuance, and may be renewed for another twelve months.

When the applicant for a passport is to be accompanied by his wife, minor children, and maid servant, who owes allegiance to the United States, it will be sufficient to state the fact, giving their names in full, the dates and places of their births, and the allegiance of the servant, when one passport will suffice for all those under 21 years of age. In such case, however, photographs of each person should accompany the application. For a man servant or any other person in the party a separate passport will be required. A woman's passport may include her minor children and maid servant under the above conditions. The term "maid servant" does not include a governess, pupil, companion, or person holding any like relation to the applicant for a passport.

After a passport has been received from the Department of State it is necessary to obtain a clearance certificate at the port of departure to show that the income tax laws have been complied with. It is also necessary to obtain visés from the consuls representing countries named in the passport.

Passports are in effect a request to the governments of friendly countries to admit the bearer to their territory, with all the rights and privileges to which he may be entitled by treaty or convention as a citizen of the country issuing the passport. Passports may be given for goods as well as for persons; and in time of war a ship's passport is a voucher of her neutral character.

Pasteur, Louis, päs-tẽr′ (1822-1895), a French chemist. He was born at Dole. He was educated at Jena and Paris. He became professor of chemistry in the University of Paris. He became interested in the study of hydrophobia and fermentation. He was one of the leading men in the study of disease germs and means of killing bacilli, especially by heat. Pasteur taught the possibility of excluding germs by canning, and was of service to the brewers and wine makers by pointing out the germ nature of fermentation. He taught the method of heating and bottling milk known in scientific circles as "pasteurization." Pasteur showed that inoculation is the introduction of pox germs. He died while investigating the diseases of the silkworm. Pasteur put bacteriology on a firm scientific basis. See RABIES.

Pasteurization, process of partial sterilization of milk by heat. To be completely sterilized milk should be heated to the boiling point several times with intervals between to allow the surviving spores to develop. The peculiar cooked taste, unpleasant to many people, of this boiled milk, is avoided if the milk is heated to 140° F only; and this temperature is sufficient to kill those bacteria responsible for

the souring of milk as well as the disease germs often found there. This is known as pasteurization and has come to be widely used. This treatment reduces the danger from pathogenic bacteria and adds to the keeping qualities of the milk. It does not, however, do away with the necessity of keeping it in a cool place, so that the spores present will not develop. These, without the counteracting influence of the lactic acid bacteria, often produce changes in the milk which are injurious to the digestion, particularly of children. Pasteurization is not to be regarded as a substitute for sanitary conditions in the production and care of milk, nor for the use of ice during the warmer months.

Pastoral, a variety of epic poetry, the special province of which is the description of rural life and of homely, peaceful scenes. The pastoral is usually narrative to some degree. It contains little action. It appeals to the gentler emotions. Goldsmith's *Deserted Village* and Thomson's *Seasons* are pastoral poems. See POETRY.

Patagonia, a region at the southern extremity of South America. It is no longer a political division. It was discovered by Magellan in 1520. Darwin brought home interesting notes of the fauna and flora in 1839. It is a region of rocks and scanty vegetation. The climate is cold. The cactus is a characteristic plant of the uplands. The willow is found along the streams. Travelers have called attention to the fact that birds accustomed to nest in trees elsewhere are here compelled to nest and perch on the ground. The Patagonians, now few in number, are noted for their stature. The average height of the man is five feet, eleven inches. The region has been divided between Chile and Argentina. See PENGUIN; CHILE; ARGENTINA.

Patent, an exclusive right to make, use, or sell an invention. The governments of enlightened countries take the view that an invention is as much the property of the inventor as a house is the property of the builder. American patents running seventeen years may be had on making proper application to the United States Patent Office, Washington, D. C. The details may be learned by writing the department for a pamphlet of directions. Any person may make application for a patent regardless of age, nationality, or sex. An inventor should send a notion of his idea to a patent attorney in Washington, who will investigate the files of the office to ascertain whether the invention is already covered by a patent. The records of the patent office are open, but the officials will not make a preliminary search. This expense must be borne by the inventor. The application, with a preliminary fee of $15, must be accompanied by specifications and a drawing executed in a prescribed manner in India ink on bristol paper, and by affidavit that the applicant believes himself to be the original inventor.

The fees, payable in advance, are, on filing each original patent, $20. Charges for making drawings and appeals vary. Unless the applicant is familiar with the methods of procedure, he should apply to a patent attorney.

Pater, Walter Horatio (1839-1894), an English essayist. He was born in London and received his education at Canterbury and at Oxford. He had intended to take orders in the Church of England, but, as his religious views changed, he began to regard himself as a Unitarian and thought to become a Unitarian minister. This, too, was given up by the time he was twenty-five years old. From this time his viewpoint as regards religious subjects was rather that of the philosopher. Among his works may be mentioned: *The Renaissance: Studies in Art and Poetry, Marius the Epicurean: His Sensations and Ideas, Imaginary Portraits, The Child in the House, Esmerald Uthwart,* and *Miscellaneous Studies.* Pater's prose is rhythmical but his language is frequently obscure, owing possibly to the subtlety of his thought. His style is refined, delicate, and charming, without possessing those qualities of vigor and force which stimulate and inspire the reader.

Paterson, an industrial city of New Jersey, and the third city in size in the state. It is on the Passaic River, seventeen miles northwest of New York City. The celebrated Passaic Falls afford abundant waterpower which has made of Paterson one of the most important manufacturing

centers in the country. The leading industry is the manufacture of silk, which fact has won for the city the nickname of "the Lyons of America." Thread, twine, shirts, and locomotives are manufactured, and there are flax mills, machine shops, foundries, breweries and meat-packing establishments. The most noteworthy building in Paterson, from an architectural point of view, is the Danforth Memorial Library, the gift of Mrs. Mary E. Ryle. Other buildings of importance are the courthouse, the city hall, and the post-office. There are several hospitals and philanthropic institutions, an excellent public school system, two large parks and several small ones, and many handsome churches and fine residences. Paterson is served by three railroads. Its population in 1920 was 135,866.

Paterson, William (1839 - 1914), a Canadian statesman who had the distinction of becoming the first Dominion Minister of Customs, was born at Hamilton, Ontario, and acquired his education there. Mr. Paterson engaged in business for a number of years, entering political life as the mayor of Brantford, 1872-73. In the latter year he was elected to the Dominion Parliament by the Liberals, serving until 1911. Mr. Paterson was appointed controller of customs in the Laurier cabinet, and was active in framing the customs tariffs of 1897 and 1907. When the office was made a ministry, Mr. Paterson was chosen Minister of Customs. In 1902 he was made a member of the Colonial Conference in London; later, he was appointed special commissioner for the improvement of trade between Canada and the West Indies. In 1911 he conducted the Canadian side of the Taft-Fielding reciprocity treaty with the United States. After the defeat of the Laurier government he retired from public life.

Pathology, the science which treats of diseased and abnormal conditions of the body. It deals in particular with the changes which the tissues undergo through infection or injury, and treats of all abnormalities and the relation of their development to the species and to the individual. All influences are considered, whether they be external, that is, physical or chemical, or biological and hereditary. Pathology is distinctly a modern science, and the use of the microscope has done much to revolutionize the diagnosis of the disease. The great name in the history of pathology is that of Virchow who lived from 1821 to 1902. He established the principle that every animal tissue is made up of cells, and that every cell arises only as the direct offspring of another cell. With this step was established the doctrine of cellular pathology, and later researches in this field have only corroborated and verified the statements made by Virchow. Other names of importance are those of Pasteur, Koch, Liebig, Metchnikoff, Ehrlich, and Behring.

The subdivisions of this science have become very numerous within the past few decades, as a result of the important discoveries that have been made. Some of these are: Pathologic anatomy, pathologic physiology, pathologic chemistry, vegetable pathology, animal pathology, and comparative pathology, all of which are self-explanatory terms.

Patmore, Coventry (1823-1896), an English poet. He was a native of Essex County. He inherited literary ability from his father. He held a position in the British Museum for over twenty years. Patmore was a contemplative, intensely religious man. His associates were disposed to scoff both at him and his verses. In 1868 he entered the Catholic church. He published slender volumes of verse and religious prose at various intervals extending from 1844 to the year preceding his death. Instead of a descriptive list of his writings we give his entire *Toys,* one of the most touching bits of writing in the language:

My little Son, who look'd from thoughtful eyes
And moved and spoke in quiet grown-up wise,
Having my law the seventh time disobey'd,
I struck him, and dismiss'd
With hard words and unkiss'd,
His Mother, who was patient, being dead.
Then, fearing lest his grief should hinder sleep,
I visited his bed.
But found him slumbering deep,
With darken'd eyelids, and their lashes yet
From his late sobbing wet.
And I, with moan,
Kissing away his tears, left others of my own;

For, on a table drawn beside his head,
He had put, within his reach,
A box of counters and a red-vein'd stone,
A piece of glass abraded by the beach,
And six or seven shells,
A bottle with bluebells,
And two French copper coins, rang'd there with
careful art,
To comfort his sad heart.
So when that night I pray'd
To God, I wept, and said:
Ah, when at last we lie with tranced breath,
Not vexing Thee in death,
And Thou rememberest of what toys
We made our joys,
How weakly understood
Thy great commanded good,
Then, fatherly not less
Than I, whom Thou hast moulded from the clay,
Thou'lt leave Thy wrath, and say,
"I will be sorry for their childishness."

Patriarch, the head or ruler of a tribe in ancient times, when the oldest man in the tribe was regarded as chief in both religious and political matters. The most famous examples of patriarchs are Abraham, Isaac, Jacob and the sons of Jacob. Long afterwards in Jewish history the president of the Sanhedrin in Judea and Syria adopted the name.

The title was later carried over by the Christians, and applied to the bishops of wider jurisdiction than the average. The heads of the four great Catholic centers, Rome, Constantinople, Jerusalem, and Antioch were called patriarchs. It followed that the patriarchs of the leading Catholic city, Rome, later became the Pope.

Aristotle's book, *The Politics,* explained in detail the theory of the patriarchal family.

Patrick, Saint, the patron saint of Ireland. He lived about 396-469. The name is Latin, signifying patrician. According to one tradition he was born near the present town of Dumbarton, Scotland, where his father was evidently a man of some standing, a deacon in the Roman garrison. Patrick was captured by a marauding expedition of Irish Picts and sold into slavery in Ireland. Here he led a hard life, but succeeded after a time in escaping. He then, according to the popular account, fitted himself for the priesthood in France and at Rome, where he obtained permission from Pope Celestine to return to Ireland to convert the natives to Christianity He left two pieces of writing; one, a so-called *Confession,* is a defense of his work in Ireland and is in a way autobiographical. In reality, beyond the fact that he was one of the earliest, if not the first priest to preach Christianity to the Irish, little is known regarding the details of his life. The popular saying that St. Patrick drove the snakes out of Ireland is peculiar, as snakes never existed in that island. All accounts seem to imply that St. Patrick was not an Irishman at all, but a man of Roman ancestry, born in Scotland,—a Christian missionary to the Irish. The 17th of March is observed by the Irish as St. Patrick's day. See SHAMROCK; IRELAND.

Patricians, the members and descendants, by blood or adoption, of the original Roman families of which the population was composed until the establishment of the plebeian class as a distinct order. Originally the patricians were divided into three tribes; in each tribe were ten curiae; each curia consisted of ten gentes, or was represented by ten decuriae. There was constant conflict between the patricians and the plebeians during the first centuries of the republic, and at the end of the republic the patricians were represented by only fifty surviving families, while the plebeians had succeeded in gaining political equality with the upper class. A new aristocracy had sprung up. This was founded on possession of wealth and on the holding of the offices of praetor, consul, and curule aedile. Constantine the Great instituted a new personal title, in an effort to restore the old patrician dignity. Charlemagne adopted for himself the title of patrician, and even in recent times noble families who hold exalted offices retain the title, especially in the Italian cities. The term aside from its historical is used also in an applied sense, to denote that which is exclusive, as a patrician taste, etc.

Patroon, pa-trōōn′, in American history, a name applied by the Dutch government to certain landed proprietors in the valley of the Hudson and the Mohawk. The term is akin to the English patron. Beginning with 1629 the Dutch West India Company, by whom the New Netherlands, afterward known as New York, was colo-

nized, offered tracts of land and certain privileges to any leaders who would found colonies of not less than fifty persons. Numerous tracts fronting on the Hudson and the Mohawk, comprising the finest lands in New York state, passed in this way into the possession of patroons. When the colony became a possession of England the patroons retained their rights. They formed a sort of colonial aristocracy and held high political and social stations in the colony. They allotted lands to settlers on condition of paying rent. Early in the nineteenth century the settlers began to protest against the payment of rent. Anti-rentism became a political issue. About 1839 the situation became critical. Angry disputes arose. Agents or sheriffs sent to collect rents were maltreated and even killed. The private grounds and possessions of the patroons were assaulted by mobs. The sum demanded by the patroons varied from $7 to $18 a year for each hundred acres, possibly less than is now paid as taxes. After several years of agitation the difficulty was settled by the plan of allowing the occupants of the farms, now become exceedingly valuable, to purchase a complete title at a nominal price. The patroon and the anti-rent disputes passed into history.

Patti, păt′tē, **Adelina Maria** (1843-), an Italian opera singer. She was born in Madrid, Spain. At the age of seven her extraordinary voice attracted attention and is said to have rescued her family from dire poverty. She was brought to America and appeared in concert when she was nine years old. On November 24, 1859, she first appeared in opera at the Academy of Music in New York City, in the role of Lucia. She made her debut in London, at Covent Garden in 1861, appearing as Amina in *La Sonnambula* with brilliant success. After that her career was one long record of triumphs, and in all the large cities of Europe her arrival was hailed with enthusiasm. Her success was due in part to the magnetism that always accompanies personal grace and charm, but far more to the beauty of her pure, clear voice which possessed remarkable range. She made her farewell tour of America in 1903. In 1868 she married the Marquis of Caux, was divorced in 1885, and in 1886 married Signor Niccolini, an Italian opera singer. One year after his death she married a Swedish nobleman, Baron Cederstrom, with whom she lived in her country home at Craig-y-Nos, near Swansea, Wales, until her death in 1919.

Paul, Saint, an apostle of Jesus Christ. His birthplace was Tarsus, at that time a splendid city of Cilicia, in what is now the Turkish province of Adana, in Asia Minor. "A Hebrew of the Hebrews" he was thoroughly schooled like other Jewish youths in the Hebrew law and the prophets, first at Tarsus and later at Jerusalem under the great teacher Gamaliel. A pure-minded youth of clean life, he naturally became the religious zealot whom we know so well from the Bible narrative as a persecutor of the Christians. The most striking event in Paul's life was his conversion on the road to Damascus from a rabid hater of Christianity to the apostle who did more than any other man to spread and keep alive that faith. After this soul-stirring experience Paul retreated to Arabia, there to cultivate his new-found faith and to make himself spiritually ready for whatever might fall to him to do. He emerged from this period of seclusion ready for the series of long, difficult missionary journeys which lay before him. Probably Paul was the greatest missionary the world has known. He realized, as the other apostles did not, that Christianity was for the Gentiles as well as for the Jews, and his one thought in life was to carry his faith to them, regardless of persecution or imprisonment or any other thing. He organized new churches, visited others, wrote letters of admonition and encouragement to his congregations, and preached always "Christ and Him crucified." From his *Epistles* and from *The Acts of the Apostles* we have the fragmentary story of his life. The time, place and manner of his death are unknown, though we know he suffered martyrdom in some form.

Why he was called Saul in his early life and Paul after his conversion is a matter for conjecture. It is thought that he may have been called Saul for the first of the Jewish kings and that Paul was a second name, such as was possessed by Simon Peter and John Mark.

Paulding, James Kirke (1779-1860), an American politician and writer. He was a native of Dutchess County, New York. He received a village school education. He removed to New York City in 1800. In 1807 he entered into a literary partnership with Washington Irving in the publication of the humorous articles known as the Salmagundi papers. Twenty numbers appeared. During the war of 1812 he acquired some note as a writer of political pamphlets, including *The Diverting History of John Bull and Brother Jonathan.*

Pauncefote, Julian, First Baron (1828-1902), a noted British diplomat, for thirteen years British Ambassador to the United States. He was born in Munich, Germany, of English parents, and was educated in Paris and Geneva. He was called to the bar in 1852. Going to Hong Kong, China, in 1856, Baron Pauncefote practiced law there, and in 1866 was made Attorney-General of the colony. In 1873 he was appointed Chief Justice of the British Leeward Islands. In 1874 he was made Undersecretary for the Colonies, and in 1876 was given the corresponding position in the Foreign Office. In 1882 he was made permanent Undersecretary of State for Foreign Affairs, served as British Minister to the Suez Canal Commission in Paris in 1885, and was appointed Minister to the United States in 1889. In 1892 the title was changed to Ambassador, and Baron Pauncefote thus became the first British Ambassador to the United States. Among the important problems with which he had to deal in his diplomatic capacity were the Behring Sea and the Venezuelan controversies, and the revision of the Clayton-Bulwer Treaty. His wide knowledge of world affairs, and his fine tact combined to make him an able minister. He was for many years the dean of the diplomatic corps at Washington. He attended the Hague Conference of 1899 as senior British delegate and was active in the establishment of the permanent Court of Arbitration.

Pauperism, a condition of large masses of people who are dependent on public aid for permanent support. The causes are chiefly those of thriftlessness, vice, indiscriminate giving of alms, and wilful neglect. In those stages of civilization where slavery has been a recognized institution, pauperism was practically unheard of, because of the fact that slaves and poorer classes were protected by their masters. In the Middle Ages, the vagrants and mendicants were cared for by the church. In Europe the poor receive care and support in various ways. Within the last few years Germany has made a close study of the problem and through wise administration of relief and guarded control of relief funds is said to have solved the problem of charity and want for at least forty million people. In England, at the time of the industrial revolution, the situation grew alarming because of the fact that the relief fund had increased fourfold, and that thousands of able-bodied men had been unduly pauperized. The New Poor Law of 1834 brought about a much-needed restriction.

Pavement, covering of wood, brick, asphalt, or stone, used for street or roadway to ensure smooth and hard surface for travel. The streets of Babylon are spoken of as paved in 2000 B. C. Pavements are said to have been used in the Roman cities, Rome, Pompeii, and Herculaneum. All the modern cities of any size use pavements on at least the important streets and throughfares. The first consideration for a durable pavement is the construction of a good foundation. Sand or gravel, three to six inches thick, is used; also concrete in varying depth of six to twelve inches.

As to material, wood is the cheapest, but it is not durable even when precautions, such as creosoting, are taken to avoid decay. Stone pavements are laid in the business streets of the large cities, and where traffic is heaviest rectangular granite blocks are used, despite the fact that this is one of the most expensive pavements in general use. Brick has been resorted to extensively in the western United States since 1880. The most durable bricks are those which are of uniform hardness, low porosity, hard burned and not vitrified, though presenting a glassy appearance. The asphalt pitch of Venezuela, also that found on the island of Trinidad, is used extensively for residence streets. Asphalt pavement is durable for

light traffic, is more expensive than is wood or brick, but is easily maintained, repaired, and cleaned. It is noiseless, and has the advantage of growing more compact with use, instead of wearing away.

See ASPHALT; BRICK.

Pawnbroker, one who lends money on the deposit of goods. Wearing apparel, watches, jewelry, and other portable belongings are the articles usually pawned. The traditional pawnbroker loans but a fractional part of the value of the article. He issues a receipt on a ticket redeemable before the expiration of a certain time. He charges a high rate of interest. Pawnbrokers are forbidden by law in many quarters of Europe. In others, charitable or state pawnbroking shops have been established in order to relieve the poor from oppressive charges. In France and Italy the government pawnshops are known as *Monts de Piété,* or Banks of Charity. Those of France alone take in from 1,000 to 2,000 watches a day. In the Middle Ages the business of pawnbroking was entirely in the hands of the Jews. It is said to have originated in Lombardy, the source, also, of our banking system. The pawnbroker's traditional sign of business is a cluster of three golden balls. It is said to have been derived from the coat of arms of the De Medici family. Pawnbroking is now confined chiefly to English-speaking countries. The pawnbroker is regularly licensed. A list of articles pawned must be sent to police headquarters daily. Anyone believing that a stolen article may have reached some pawnbroker's shop is entitled to search the premises on taking out a proper warrant to do so. The rate of interest charged is in many states regulated by law. After the expiration of the time of redemption the pledges become the property of the pawnbroker and may be offered for sale.

Pawnees, a confederacy of tribes of North American Indians. They inhabited formerly the valleys of the Platte and the Republican rivers of Nebraska. Their hereditary foes, by whom they were surrounded, were the Sioux and the Shoshones. In 1833 they surrendered all their lands south of the Platte. In 1876 a remnant removed to Indian Territory, where about 500 of their descendants still exist.

Pawtucket, a city in Rhode Island on the Pawtucket and Blackstone Rivers, four miles from Providence. Like so many New England cities it has abundant water-power furnished by the falls of the river, in this case the Blackstone. Its more important manufactures are cotton and silk fabrics, spool cotton, woolens, foundry and machine shop products, wire, yarns, hosiery, knit goods, cured meats, textiles, jewelry, nails, bobbins, spindles, lumber, wagons and carriages, machinery for weaving, and automobiles. Among the prominent institutions are a public library, a fine Y. M. C. A. building, an old ladies' home, an emergency hospital, and a state armory. There are several public parks, and fine bridges. Pawtucket Falls, fifty feet in height, is an attractive feature. The population in 1920 was 64,248.

Payne, John Howard (1791-1852), the author of *Home, Sweet Home.* He was born in the heart of New York City, June 9, 1791. Part of his boyhood was spent at East Hampton, Long Island, and part in Boston. At the age of fifteen he became a clerk in a New York counting house. He attended Union College two years. From earliest boyhood he had a passion for the stage. In 1809 he took the part of Young Norval in the Park Theater, New York. During the winter of 1812-13 young Payne spent the season with his troupe in London, where he worked over a French play, calling it *The Maid of Milan.* The play itself is of no particular importance, except that in it appeared the song, *Home, Sweet Home,* which has made its author immortal. Payne lived for some years in London, numbering among his friends both Coleridge and Lamb. He wrote a number of plays, some of which made his managers money; but Payne himself was always burdened with debt. In 1832 he took up his residence again in New York. In 1841-5 he was United States consul at Tunis, Africa, and again, from 1851, he held the same position until his death in that far away land, April 10, 1852. Payne was by turns an actor, playwright, editor, poet, and consul. He was a sort of houseless, homeless wanderer. His remains were brought home in 1883. He lies in the old Oakdale cemetery in Georgetown.

Pea, a climbing garden herb originally from the vicinity of the Mediterranean. There are perhaps six species. Our varieties in cultivation are all one, though sometimes divided into field peas and garden peas. Peas are cultivated in India and yet are grown far into the north where a short, quick summer brings them to maturity. Split peas are used to thicken soup. The people of certain localities are on this account called "pea soups" in fun. Peas cut green are an excellent fodder for cattle. Peas are related to clover, and are raised largely for this purpose in Scotland.

Green peas are a staple vegetable in the home and market garden. The business of canning peas has grown to immense proportions. A machine has been devised even for threshing the peas out of the green straw. A field of green peas is cut, fed through the machine, and the peas are canned the same day. France still leads in reputation for fine canned peas. Of many varieties, marrowfats are the best grown by American gardeners.

From the botanical point of view it is interesting to know that the flower of a pea is made up of twenty-one altered leaves. Beginning at the outside, five are the green pointed sepals; five are the colored petals of different shapes; ten, greatly changed, are the ten stamens that stand like a hollow cylinder; and one in the center folded lengthwise makes the pod. The peas grow along the edges of what would have been a leaf. By splitting the pod carefully the peas may be seen in two rows. Much the same may be said of beans. Sweet peas are more nearly related to the "wild peas" climbing in copses.

See VEGETABLES; CLOVER.

Peabody, George (1795-1869), an American merchant. He was born at Danvers, Massachusetts. His parents were poor and were able to afford him only a common school education. He became a grocer's clerk at the age of eleven. At the age of seventeen he went to Georgetown, D. C., to act as a clerk in the grocery store of an uncle. Later he became engaged in the wholesale dry goods business at Baltimore. His partner was a man of wealth. Peabody had the actual management of the business. He traveled for years as a salesman in New York, Pennsylvania, and Virginia. He built up a large business, becoming both influential and wealthy. Later, in purchasing goods for his firm, he made several trips to London. He sold out his dry goods business and opened a banking house in London under the firm name of George Peabody & Co.

Peabody amassed a fortune, which he devoted largely to charitable purposes. He gave $200,000 to his native town of Danvers to found a free library and lecture course. The name of the town was changed to Peabody in his honor. To Baltimore, the city in which the foundation of his fortune was laid, he gave $1,400,000 to found an academy of music and art, in connection with which a free library and an art gallery should be maintained. He presented Yale $150,000 for a museum of natural history. He gave Harvard a similar sum for a museum of archaeology and ethnology. Salem, Massachusetts, received $140,000 for the Peabody Academy of Science. He donated a sum of money, now known as the London Peabody Fund, amounting in all to $2,500,000, to be expended in the erection of model tenement buildings for the poor of London. These buildings are leased at a nominal rent and have been the models for other efforts of the kind. Among minor gifts may be mentioned $13,000 to Newburyport for a beautiful library; $10,000 to Dr. Kane to aid in the search for Sir John Franklin's body; and $50,000 to aid the exhibit of the United States at the London World's Fair.

One of Peabody's last gifts was the princely sum of $3,500,000 for the encouragement of education in the Southern States. This fund has been administered by a body of fifteen trustees. The plan of the board has been to strengthen existing institutions rather than to establish schools. A large number of grants, varying from $300 to $1,000 a year, have been made to worthy schools. A number of scholarships for the aid of needy students have been established. Up to 1905 about $3,000,000 had been paid out. The history of the fund in detail may be found in the United States Commissioner of Education's report for 1898. Mr. Peabody's gifts amounted in all to about $9,000,000.

At his death, which occurred in London, his remains were honored by public service in Westminster Abbey. They were sent to the United States by the British ship of war Monarch. He was buried with fitting public ceremonies at his native town of Danvers, now Peabody.

Peace River Country, one of the few really fertile regions of North America that are still open to settlement. The Peace River Country, 87,850 square miles in extent, lies in the drainage basin of the Peace River, in the province of Alberta. The Peace River is formed by the junction of the Parsnip and Finley rivers, which rise in British Columbia; from the junction to the confluence of Peace River with Slave River are 815 miles of water varying in depth from twenty to thirty feet and in width from one-half to three-quarters of a mile. For vessels of light draft about 500 miles of this river are navigable.

A few years ago the possibilities of the Peace River Country were realized by only a few people. Transportation was poor, markets were few, and fewer still were those who were inclined to risk their savings—perhaps their lives—in the development of a more or less unchartered region when good land was to be had in a kindlier part of the Dominion. Gradually, however, the frontiers were extended, transportation facilities were improved, and the natural increase of population—assisted by the right kind of immigration—wrought changes. The Edmonton, Dunvegan & British Columbia and Pacific Great Eastern railways built towards northwestern Alberta, and the completion of these roads will greatly stimulate movement into this rich district.

Today there are many thriving farms of 500 or more acres near the larger settlements, such as Fort Vermilion, Peace River Landing and others, whose owners annually ship cereals, especially wheat, in large quantities to the markets that lie southward. Forty-two bushels of wheat to an acre are not unusual; oats, barley and hay are grown; there is also an abundance of wild hay; and tomatoes and other vegetables are raised. The water supply is plentiful, and some parts of the district are ideal for stock raising.

Timber and Minerals. There are signs that indicate a once very dense growth of timber in the Peace River Country, and there are still valuable stands of pine, tamarack, cottonwood and spruce, though the old first growth has almost all been destroyed by fire. The old burnt-over regions are now covered with a valuable second growth of aspen and birch. The lumbering industry is rapidly extending.

A search for minerals has been made and is still made, but no mineral in valuably workable quantities has yet been found. Gold and iron, lignite and gypsum, natural gas and petroleum have been found. The latter was the latest find, and its commercial possibilities at present seem to be greater than those of any of the others.

Fish and Wild Animals. Though the Peace River is not of itself highly productive of fish, the country as a whole is well stocked. The most important kinds are whitefish, lake trout, grayling, pickerel, pike and bluefish. These are present in quantities sufficient for the needs of the settlers, but their commercial value is unimportant.

This is, however, one of the comparatively few spots in North America where game is abundant. In the extreme north game is abundant. In the extreme north herds of caribou are found, and moose, black and brown bear, red deer, blacktail deer, ducks, geese and prairie chickens are plentiful. The fur-taking industry is important and is yearly increasing in extent. The principal fur-bearing animals are muskrat, lynx, beaver, mink, otter, black and red fox, wolf, marten and weasel. This will be a source of fur supply for many years to come.

Peach, a small fruit tree closely related to the plum, cherry, apricot, and almond. The different kinds of peaches, including nectarines, are, it is thought, descendants of the same stock, native to China, but coming to us by way of Persia and Europe. There are nearly 300 varieties. They are arranged in five groups of which the Peen-to

or flat peach, the pointed or honey peach, the Cabler, the Elberta, and the Crawford are the types. Another division is that into clingstone and freestone peaches, referring to adherence of the pulp and stone.

The chief peach-producing regions of America are the Atlantic coast from Connecticut to the Chesapeake Bay, extending inland possibly a hundred miles; the foothill districts of Georgia and Alabama; an area extending from southern Illinois across Missouri into Kansas; a region extending from Ontario westward to Lake Michigan; eastern Texas; western Colorado; and the greater part of California. Too far north peaches winterkill. Georgia peaches are sent to market in refrigerator cars. Michigan peaches have but a few hours' ride across the lake to Chicago, one of the best markets. Delaware growers are within a few hours of New York and Philadelphia. The irrigated valleys of western Montana, Idaho, Washington, and Oregon are attracting attention as important peach centers.

In cultivation, the peach requires much the same treatment as the plum. Botanically, the seed resembles a plum pit. Seeds may be planted in rows a few inches apart. In midsummer, the young scions are grafted by budding. In the peach orchard they should be planted from twelve to twenty feet apart. Peach trees begin to bear in the third year. A tree in full bearing is expected to produce from one to ten bushels yearly. The life of the peach tree is about twenty-five years, only ten years of which, however, can be counted on as productive. To secure the best results the branches must be pruned to admit sunlight. The fruit should be thinned so as to hang five or six inches apart.

The peach tree is the most delicate of all orchard trees. It grows best in light soil. It is particularly subject to frost. In the North the twigs of the peach are likely to turn yellow. In the South, for some similar unexplained reason, the twigs dwarf and produce thick rosettes of leaves. Twig-blight, leaf-curl, and black-spot are common names given to as many forms of fungi that attack the young twigs. Peach raisers spray with Bordeaux mixture as a preventive.

The peach tree is subject to the attacks of several insects. Among these enemies are the twig-borer, the bark-beetle, bark-lice, the leaf-roller, a peach weevil, and several scale insects. One of the most troublesome enemies is the curculio, the foe, likewise, of the plum. In many instances the only cure for a diseased peach orchard is to cut down the trees, burn them, and start anew.

The following are the latest peach statistics available:

State	Bushels
California	12,848,000
Georgia	6,550,000
Texas	2,200,000
New York	1,700,000
Alabama	1,230,000
Colorado	860,000
Washington	772,000
Utah	763,000

See BORDEAUX MIXTURE.

Peach Insects. The peach has many insect enemies, because it has such a pleasant taste and odor. Chief among the hostile band is the peach-tree borer, which is the larva of a moth of the sesiid species. In appearance it is like a wasp, and it does its work in the daytime. This species appears in the northern United States and Canada in July and August, and it is in the south much earlier.

Other pests of the peach tree are the peach-twig borer and the fruit-tree bark beetle. The former arrives very early in the spring, and kills the leaves just when they are beginning to bloom. The bark beetle spends most of its energy on old trees, into which it bores large holes. The infested trees should be destroyed.

Peafowl, a remarkable bird of the grouse family. Alexander the Great is credited with having brought the common peafowl from India. In southeastern Asia the peafowl is yet a game bird, and is hunted like our wild turkey. The male or peacock is famous for a gorgeous train. The upper or covert feathers of the tail are frequently four feet in length. When the peacock struts, gobbler fashion, these feathers are erected and spread in a fan-like circle with a most dazzling effect of brilliant green and gold. The tail itself is chestnut and remains in an ordinary position. The neck and breast are colored with a peculiarly rich

"peacock" blue. The head carries a crest of about twenty-four upright plumes. The total length of the bird from the point of its bill to the end of its train is about six feet. The body proper is only about two feet in length. The peahen is smaller and is modestly colored. The peafowl is now domesticated thoroughly both in the Old World and the New. Among the Greeks and Romans it was dedicated to Hera or Juno. In literature it is represented as the type of vain glory. Its flesh, like that of pheasants and grouse generally, is excellent for table use. Its voice, like that of the guineafowl, is exceedingly harsh, as though nature begrudged a sweet voice and brilliant plumage to the same bird.

Peale, Charles Willson (1741-1827), an American portrait painter. He studied under Benjamin West in London, and for a time was the only portrait painter of any ability in the colonies. Washington sat for him fourteen times, and other great men of the colonists were his patrons, some of them being Robert Morris, Gates, Baron de Steuben, Rochambeau, Franklin, Jefferson, Hamilton, Monroe, Jackson, John Quincy Adams, Calhoun, and Clay. Peale had a museum of natural history, including also a gallery of portraits, which he opened in Philadelphia in 1802.

Peale, Rembrandt (1778-1860), an American artist, son of Charles Willson Peale. As did his father the boy studied under West, going from London to Paris, where he painted portraits for Peale's Museum. He returned to Philadelphia in 1810. He, too, painted several portraits of Washington, the one of 1823 being particularly noted. It was bought by Congress for $2,000. In 1833 Peale set up his studio in London. Among his best-known pictures are *The Roman Daughter, The Court of Death, The Ascent of Elijah,* and portraits of Jefferson, Mrs. Madison, and other prominent Americans.

Peanut, a plant of the pea family having the remarkable habit of bearing its pods on underground stems. Also called groundnut and goober. There are several species. Botanically the peanut is a peapod and not a root at all. Peanuts are planted in rows and cultivated like beans which they resemble in many ways, except that the fruit stems run underground. Peanut plants are grown best in light, sandy soils and are lifted when harvest comes by a specially constructed implement known as a peanut plow, which tears the plants out and shakes them free of soil. The peanuts are then pulled off by hand, dried, cleaned from dirt, bleached, and sent to market in large sacks. They go twenty-two pounds to the bushel. Peanuts form an important article of food among certain African tribes. Naturalists are of the opinion that our peanut is a native of Brazil. Its cultivation in the United States prior to the Civil War was restricted to the southeastern part of Virginia. The great number of Northern soldiers encamped in that region acquired a taste for the peanut, and on their return made it known all over the United States.

The peanut is a very rich and nutritious nut production in the United States are given in the following table:

State	Pounds
Alabama	181,500,000
Georgia	133,320,000
North Carolina	129,579,000
Texas	123,825,000
Virginia	109,068,000
Florida	54,000,000
South Carolina	33,250,000
Mississippi	12,350,000
Arkansas	11,520,000
Oklahoma	10,800,000
Louisiana	8,766,000
Tennessee	8,487,000

The peanut is a very rich and nutritious food, containing much caloric strength.

Peanuts are used for home consumption, and in the making of confectionery. Peanut oil and peanut butter are also in the market. Peanut vines cut green and properly cured make excellent forage for horses and cattle. Peanut pasture is very acceptable also to hogs. The French use peanut oil as an adulterant for olive oil, in soapmaking, and as a lubricant.

Children who are fond of peanuts will understand this riddle:

> Little yellow twins were they,
> Both neatly dressed in red.
> I broke into their yellow house
> And took them from their bed.

Pear, a fruit tree closely related to the apple and quince. As in the case of an apple, the core is the seed pod imbedded in a fleshy receptacle which we eat. The

first American pear tree is said to have been planted in the garden of Governor Endicott, Boston, in 1630. Pear culture follows the methods of the peach and the apple orchard. The pear ripens later than the apple and is less hardy. Our pear regions are restricted. Pears winterkill, are subject to drouth, and cannot endure heat. They thrive in the region extending from New England to the Great Lakes, and on the Pacific slope. The best known varieties are the English Bartlett and the American Seckel. The Kieffer is a recent favorite. Fancy pears are sent to market in crates, each pear wrapped in tissue paper. California ships immense quantities of pears, well on toward 4,000,000 cases of crated pears, several million pounds of dried, and a half million cases of canned pears annually. American pears are well known in British markets. See APPLE.

Pearce, Charles Sprague (1851-1914), an American-French artist, born in Boston. He studied in Paris under a French teacher and in 1885 removed to Auvers-sur-Oise, near the city; later he married a French woman. Mr. Pearce has won more than a dozen medals by exhibitions of his paintings, and has been decorated by the rulers of several European countries. Among his best-known pictures are *Death of the First-Born, The Shepherdess, Fantaisie, Meditation, Decapitation of St. John the Baptist, Prelude, Toilers of the Sea,* and *Return of the Flock.* The decorations in the north hall of the Congressional Library are his work.

Pearl, pẽrl, a name given to the inner lining of many fresh water and marine shells. The bodies of clams, mussels, oysters, and shellfish in general are exceedingly tender. To protect these soft bodies they secrete a fluid which hardens on the inside of their coarse lime shells and provides a smooth, pearly lining of exquisite coloring. In commerce the term "mother of pearl" is often given to this lining, and the term "pearls" is reserved for round bits of the same material found loose within the shell or attached to it. The formation of pearls is explained in this way. In case a grain of sand or other substance should happen to get inside the shell the animal has no way of ejecting it, and the fluid coats the annoying grain over with films of pearl. The longer the animal lives the larger the pearl grows. The Chinese and Japanese are said to produce pearls by following nature's plan. They keep the pearl oysters in tanks or on plats of sea bottom. They take the young oyster out of the water, drop a tiny round bit of shell into the soft flesh, and return the oyster to the water for four years. These bits are covered by layer after layer until they form beautiful pearls.

The finest pearl fisheries are ten miles off the northern coast of Ceylon. Divers go down from boats and collect the pearl oysters on the bottom of the sea. Each diver goes down by a rope weighted with a stone. He remains below about sixty seconds gathering as rapidly as possible and then gives a signal to be drawn up with his basket of oysters. Each boat has ten or twelve divers half of whom are drawing breath while the others go down. The oyster gathering is done in water ranging from fifty to seventy-five feet in depth. The oysters are as broad as one's two hands. The live, dripping oysters are piled up on the shore in bins until the excessive heat of a tropical country causes the animals to putrify and the shells to fall open. The mass is then washed carefully for pearls. The divers are allowed one-fourth of the pearls. This fishing has been celebrated for 2,000 years. Cast-away shells cover the coast for miles to a depth of several feet. Aside from the activity and bustle of the pearl season, February to April, when several thousand people live in tents, the Ceylon oyster coast is deserted.

Pearls have been held in high repute in all ages. Matthew speaks of a "merchantman seeking goodly pearls, who, when he had found one pearl of great price, went and sold all that he had, and bought it." Fabulous stories are told of prices paid by wealthy Romans for pearl necklaces, up to half a million dollars, but the prices of extraordinary pearls have no real basis other than desire and the purse of the buyer.

Fresh water mussels have also yielded fine pearls. The rivers of Bohemia and Bavaria have yielded fine specimens. During their occupation the Romans found valuable pearls in the waters of Great Brit-

ain. Scotch pearls have been brought into high repute during the past century. The mother of pearl lining of shells is used widely for buttons and pearl inlaid work, knife handles, and other ornamental purposes. Birmingham, England, is a pearl button center and buys half a million dollars worth of shells yearly. The best come from Ceylon, Manila, Cuba, Panama, and the South Sea Islands.

Of late years quite a pearl industry has grown up in the upper Mississippi Valley. The fresh water mussels of the Mississippi and its tributaries from the Arkansas river to Lake Pepin are yielding considerable button material and not a few pearls. The "clams" are brought up from the bottom of the river by their own foolishness. The fisherman bends short wires into a rake so constructed that finger-like teeth are presented to the ground whichever side of the rake falls downward. A large number of these rakes are attached to a sixteen foot piece of gaspipe by short chains, a rope from each end of the gas-pipe to the boat completes the contrivance. The fisherman throws the affair overboard and drifts down stream with the current. The pipe is dragged on the river bottom behind the boat while the little rakes follow, rolling and rising and falling and adapting themselves to every inequality of the river bed. The mussels, as is well known, lie on edge hinge down with the thin edges of the shells opening upward. When by chance a wire passes between the edges of its shell the animal closes up and hangs on for its life. When the trawler thinks he may have made a sufficient catch he draws the rakes up to the boat and throws in another drag while he takes the clinging clams from the wires. The shells are worth from $3 to $20 a ton. Old shells have little or no value. It is estimated that 1,500 fishermen in the upper Mississippi Valley earn an average of $300 each during the season. Four hundred and fifty thousand dollars' worth of shells are sold yearly to factories situated at La Crosse, Prairie du Chien, Muscatine, McGregor, and other towns. Most of the factories stop short with cutting the shells into circular "blanks" suitable for all sizes of buttons. Other factories make a finished product. The blanks are ground to the proper thickness, eyes are bored, by machinery, of course, the buttons are polished, sewed to cards, and are then ready for market. During the season of 1903 a coarse pearl weighing 182 grains was found. One fisherman was fortunate enough to find a pearl which he sold in the rough for $5,500, but valuable pearls are not found often in these waters.

See CLAM; OYSTER; SPONGE.

Peary, Robert Edwin (1856-1920), an American Arctic explorer, was born at Cresson, Pennsylvania, May 6, 1856. He was graduated at Bowdoin College, and subsequently became a civil engineer in the United States navy. He was connected with the survey for the Nicaragua Canal in 1884-5. In 1886 he became interested in the exploration of the Arctic regions. To date he has visited the Arctic regions thirteen times. In 1895 he brought home to New York three large Greenland meteorites. He has surveyed the northern coast of Greenland with accuracy, and has done much to establish the geography of the polar regions. Peary set his heart on nothing less than reaching the north pole. He sailed from New York July 16, 1905, in a stout polar steamship, the Roosevelt. The outfit was furnished by the Peary Arctic Club. The Roosevelt proved to be a magnificent ice fighter and sea boat. It was furnished with a complete outfit of sledges and provisions suitable for Arctic work. Dogs and Eskimos were secured in Greenland. The Roosevelt wintered north of Greenland. Peary, with a select party, succeeded in reaching 87° 6′ north latitude, a point within 201 miles of the north pole. This was, at the time, the farthest north attained by man. The sledging party ran short of food. It was necessary to kill eight dogs, but, aside from hunger, the entire party returned without accident or death.

In 1908 Peary returned to Etah, Greenland, in the Roosevelt. The Arctic Club had faith in him, and his outfit was as complete as money and experience could provide. The white men of the crew were a picked lot and they had with them the most daring and skillful Eskimo hunters in Greenland. September seventh the ship was put into winter quarters in a port of Grant Island on the shore of the Arctic

Ocean. By the end of September the stout ship was frozen in to remain till spring. Camp was established on the land and supplies were transported by sledge farther west to the point of the island nearest the north pole. Five months were spent waiting for the ice to reach its best. Part of the time was put in to advantage in converting game into pemmican. On one hunting trip Peary and two Eskimos with their dog train returned at the end of seven days with fifteen musk oxen, a polar bear, and a deer. On another trip he brought in five musk oxen. Others secured in all some forty deer.

Commencing February 17th, the party began to leave the ship for "Crane City," the point of departure from Grant Land. Peary himself brought up the rear, leaving the Roosevelt February 22, 1909. The party that assembled at the rendezvous consisted of seven white men, fifty-nine Eskimos, 140 dogs, and twenty-three sledges. On the last day of February and the first day of March, the party traveled by divisions. In all, seven white men, seventeen Eskimos, 133 dogs, and nineteen sledges, all in a blinding storm, left the land and took up the line of march for the coveted goal. The first day the ice was so precipitous that two sledges were smashed and the team went back to Crane City for reserve sledges. The first day Peary's squad, the last of the line, made ten miles. By a day is meant merely a period of Arctic night twenty-four hours in duration.

The party, it should be understood, struck boldly over the ice fields in as direct a line as possible for the north. Snows, drifts, high winds, darkness, and a temperature of fifty degrees below zero are discomforts; but the men were clad in fur to the tip of the nose. They had frozen pemmican to eat, oil to make hot tea, and fur bags to sleep in. They fed the dogs and themselves well. They built snow igloos for shelter. They were prepared for Arctic life and knew how to make the best of discomfort, dizzy brains, and blinded eyes. But travel on a sea of ice is one constant terror for fear of open water. Sometimes, when the wind blows, the whole Arctic ice field seems to move, and more than once an observation showed that the ice had drifted the party farther backward than they had been able to travel forward. Leads, rifts, and cracks in the ice, are apt to form anywhere at any time. A rift split the camp in two one night and nearly put an end to the expedition. Sometimes a vast opening in the ice required a detour; sometimes a rift had to be ferried on a cake of ice; sometimes there was nothing to do but sit down and wait for a rift to close again or freeze over. But on Peary went, the ice grinding and gnawing and swaying as though about to engulf the party.

Peary had planned the trip well. He cut down the party, sending back four different detachments until at the last, accompanied by his faithful colored attendant, Henson, the only other citizen of the United States to reach the pole, with four picked Eskimos and forty picked dogs, he drew in his belt another hole and literally made a five-day dash for the pole. In these days he made twenty-five, twenty, twenty, twenty-five, and forty miles respectively. On the last day, fear, hunger and fatigue left him. The dogs scrambled along as though they wanted to see the north pole. The Eskimos were determined and loyal. The sky hung dark, dense, and lifeless; the horizon was black and the ice was ghostly, but at forty miles and noon, for they had started at midnight, the sky brightened and the clouds broke enough for an observation. The latitude was 89° 57′. The north pole had been reached.

Peary spent thirty hours in taking photographs, planting flags in the ice, traveling about a bit, and studying the dark horizon with his telescope. Through a hole in the ice five miles from the pole he let down his plummet to a depth of 1,500 fathoms without bottom. In winding up, the wire broke and he threw the reel away. During the thirty hours, the lowest temperature was 33° below, and the highest 12° below. April 7th, the sky being cloudless, the party packed up and started,—we cannot say south, for at the pole all directions are south,—but started home. With better knowledge of the ice fields and a lighter load and home ahead of them they frequently accomplished two days' outward journey in one, taking a noon snack in one of the old snow igloos and sleeping in the

next one. Traces of the returning parties were found along the route. The return was delayed by open leads and the party encountered real danger, but April 23d, sixteen days from the pole, the dogs scrambled up the glacier-fringed shore of Grant Land, their tails still in curl, and the Eskimos shouted and danced as though they had lost their senses. Ooath, the lad of the party, sat down on his sledge with an Eskimo, "Well, the devil is asleep or having trouble with his wife, or we never should have come back so easily."

Peary learned to his sorrow that M. Marvin, one of the white men, had been lost in a lead on the return. This was the only disaster to mar the success of the expedition. The explorers now gathered their effects into the Roosevelt. July 18th the staunch ship fought her way out of the ice pack back to the Greenland town of Etah again. Here the Eskimos were enriched with walrus meat and blubber, currants, sugar, ship's biscuits, guns, rifles, ammunition, knives, hatchets, and traps. To each of the four who went with Peary to the pole he gave a boat and a tent, making them nabobs for the rest of their lives. September 5th the Roosevelt reached the coast of Labrador, and September 6th the message was floated to the Peary Arctic Club: "Stars and Stripes nailed to the north pole."

See ARCTIC REGIONS; METEORITES.

As far as a witness to Peary reaching the pole is concerned, if he needed one, he had the best one living—Henson—a faithful colored man whose truthfulness had been attested in twenty-three years of manly and intelligent effort with his chief. Besides this, he was a man fully competent to at least record observations, and it is believed that he could have made them himself.—Rear Admiral Colby M. Chester, U. S. N.

Peasant Bard, The. See BURNS.

Peasants' War, The. See ANABAPTISTS.

Peat, pēt, a turf-like material formed in morasses by the accumulation of dead vegetable matter. In the northern part of the world peat comes chiefly from a sphagnum moss that grows in moist bogs or in regions of frequent fog. This moss grows green on the surface, but dies beneath and packs down without actual decay into a fibrous mass of indefinite depth according to the age of the morass. In warmer climes peat is also produced by aquatic plants. The peat of India is produced by an accumulation of the stalks of wild rice. It is supposed that lignite and coal were produced under circumstances that covered peat beds with soil and subjected them to immense pressure and intense heat. It is difficult to drain a peat bog. The moss holds water like a sponge.

Peat is distributed widely. South American peat formed of rushes may be mentioned. The Siberian tundras, northern Germany, Russia, and Scandinavia have extensive deposits of peat. Large bogs exist in Yorkshire. Scotland has extensive beds. Covenanter stories are always connected with moss hags and moss troopers. One-twelfth of the surface of Ireland is covered with peat bogs, giving rise to the term "bog trotters." North America, from the latitude of New England and Minnesota far up northward and northwestward to the Arctic Ocean, has enormous beds of peat.

Peat is not infrequently used in the construction of huts after the manner of our sod houses, but its chief use is as fuel. Millions of people use no other material for cooking and heating. Peat bogs, now sources of fuel, were in most cases drained long ago. They have an appearance not unlike brown stone quarries. The spongy nature of peat causes it to hold enough water to prevent deterioration. The peat is removed in sections from the top clear to the bottom, as in a stone quarry. It is cut into brick-like sods or peats or turfs by a thin, long, sharp peat spade. It is then carried ashore and set on edge to dry. It is then put under cover for later use. An excessively rainy season interferes with the drying of peat and may cause serious disasters. A countryside without dry peat is without fire. Wet peat, whether thawed or frozen, is useless. In European districts where peat is the ordinary fuel a lease of a field carries with it the privilege of cutting peat. The man of the house, or very likely the grandfather, gets into the pit with his long spade and, with a skill born of experience, cuts out thin sods of great regularity. The women and children of the family carry the peats to dry land. To cut, take ashore, dry, carry home, and stock away

a supply of peats is a regular part of the peasant family's summer work. Whether the peat beds of North America are inferior, or whether wood and coal are too plenty and cheap, very little American peat is used. A number of attempts have been made with the expenditure of large sums of money to convert peat into briquettes by hydraulic pressure, but the cost of compressing and drying has so far exceeded the value of the fuel produced that the undertaking has been unprofitable.

Peat burns with a fine glow and makes quite a lasting fire. As might be expected from the amount of soil and dust likely to light on a bog, the amount of ashes is large. Wet peat has the power of resisting decay and of preserving both animal and woody tissues for a long time. Oak trees are found in bogs, where they have lain a thousand years apparently, as well preserved as though they had not fallen fifty years ago. The bodies of soldiers swallowed up in bogs have been found, it is claimed, in a state of good preservation centuries afterward. When well drained and treated with lime or ordinary soil to start decomposition peat bogs become fields of extraordinary fertility.

Pebble, a small, rounded stone, intermediate in size between a cobblestone and gravel. The term is restricted usually to small stones, well rounded by the action of water or glacial action. They are, of course, of all colors and material, corresponding to the ledges of rock of which they were originally fragments. Conglomerate rock is composed of pebbles and cementing material. Agate is known to the jeweler as pebble. Scotch agates are known as Scotch pebbles. A transparent rock crystal, known also as pebble, is ground into lenses for spectacles.

Pecan, an American nut-bearing tree. It is a species of hickory. The pecan grows in river bottoms and on rich, well watered uplands. It is found throughout the valleys of the Mississippi and its tributaries from Davenport, Iowa, southward. Its range follows the cotton belt eastward into the South Atlantic States and westward into Mexico, but the tree does not venture into brackish waters. Under favorable conditions the pecan is a majestic forest tree, attaining a trunk diameter of 2 to 6 feet, a height of 175 feet, and a well rounded top 30 to 70 feet in diameter. The wood is valuable for fuel, but is not equal to that of the genuine hickory for manufactures.

The pecan nut is of an oblong or oval shape. Commercially, it is the most important of American nuts. Northern soldiers returning from the Civil War sang the praises of the pecan. Marketing on a large scale began about 1870. Texas, Mississippi, and Louisiana lead in the production.

The demand for superior nuts has led to careful propagation. Much attention has been given to the selection of trees that bear large nuts having thin shells, thin partitions, and plump, sweet, delicately flavored meats. Seeds from the best trees have been planted; buds and twigs from the best stock have been transferred. One zealous grower, Mr. Risien of San Saba, Texas, offered a premium of five dollars for the best wild nuts. The story runs that one sample pleased him so well that he bought the exhibitor's farm outright to secure control of the trees; but, hastening to see his prize, found to his horror that the former owner had chopped off every limb but one in gathering the nuts. However, Mr. Risien worked on a new top and originated the San Saba pecan, a small but exceedingly sweet species. The original tree, now ten feet in circumference, still stands, and produces 180 pounds of nuts yearly. As in the case of the peach, apple, and other fruits, growers find that the pecan does not come true from seed. A bewildering range of varieties comes from nuts taken from the same tree. Grafting and budding are as necessary as in the case of other fruits.

Another famous pecan is the Century. It is the largest of all, running twenty-five to the pound. Ordinarily large nuts go forty-five to the pound. Wild nuts run usually seventy to eighty to the pound. The original tree was washed away by the Mississippi River in 1890.

There are now large orchards in the pecan district. Possibly a tenth of the nuts of commerce are from cultivated trees. One difficulty arises from the size of the trees. They require to be planted so far apart that few can be set to the acre. Efforts are being made to breed a dwarf tree more the size of an apple tree. Tin flounces

are fastened about the trunks of the trees to prevent squirrels from running up to steal nuts.

In harvesting, the nuts are gathered as they fall. The operation may be hastened by whipping the tree gently with long cane fishing poles. The nuts spoil quickly if allowed to lie on the moist ground. Pecans are bought by the bushel. Wild nuts, like blueberries in northern localities, are a source of considerable income to the natives. The dealers polish the nuts usually by friction in revolving barrels. Local prices vary from three to five cents for small wild pecans up to seventy-five cents a pound for choice cultivated strains. Twelve and one-half cents is a good average price in New Orleans. As high as two or three dollars a pound are paid for pedigreed pecans desired for planting. There are large nut-cracking establishments in San Antonio, Texas, and in New York City. Texas ships most pecans, but because most of the pecans in the market are from wild trees, accurate figures are not obtainable.

Peccary, a grunting animal allied to the swine. An adult is about three feet long. Peccaries live in herds in a grassy cover, feeding on roots, nuts, and potatoes. The planters in the forest regions of South and Central America dread the invasion of a herd, especially as they are given to raiding at night. The flesh may be eaten, but white people prefer to leave it to the natives. There are two species, the collared and the white-lipped. The former ranges as far north as the bottoms of the Red River in Arkansas. It is a plucky animal of the chase in Mexico and Texas, and an enraged drove will drive a hunter up a tree.

Peck, a measure of quantity. The fourth part of a bushel. The word means originally, "a great deal," as a peck of trouble. The peck contains eight quarts or two gallons. The standard British peck contains 554.548 cubic inches. The standard United States peck contains 537.6 cubic inches.

Pedagogy, the science and art of teaching. The term is narrower in its application than education, being concerned not so much with the matter taught as with the manner and principles of its presentation.

Pedagogy, as a science, is derived from psychology and for that reason it should be studied only after a good basis of psychological knowledge has been laid. The dependence of methods of instruction upon the facts of mental phenomena is now fairly well established. As a result more time and attention are being given to the professional training of teachers than ever before. Everywhere throughout our own country normal schools are being established, courses of study are being lengthened, and the requirements for teachers are being raised. The result has been brought about very largely through child study and the increased interest in experimental psychology. The realization of the need of a longer and more thorough preparation for teaching has led to the organization of a body of matter now called pedagogy or pedagogics. In the larger schools of the country, such as at Teachers College, New York City, and the School of Education at the University of Chicago, extensive courses in the subject are offered. In the smaller schools the study of pedagogy is presented only in its relation to other courses, such as Ethics, History of Education, etc. But the purpose in either case is the same, namely, an emphasis on the principle that since a child's aptitude for learning is determined largely by conditions outside of himself, the teacher must know how to meet these conditions and organize his course of study accordingly. Generally speaking, the study embraces three divisions. (1) A study of the history of education from the earliest times to the present. (2) A study of various theories as to school-room management, the presentation of studies, the use of various devices, etc., and (3) readings and reports on late contributions by prominent educators. Among the first, Monroe's *History of Education* may be mentioned as a well-known text. In the second, McMurry's *Method of the Recitation* is a representative contribution, and among the last Page's *Theory and Practice of Teaching* and White's *School Management* have long been recognized as standards.

1. History of Education. (a) The Humanists. The earlier stages of this subject are here omitted since they have little direct bearing upon present pedagogics.

Beginning with the founding of Christianity and extending through the middle ages, the ideal of education was what is generally known as the humanistic, the period falling, roughly speaking, into the age of the Church Fathers and the age of the School Men. With both the purpose of education was the result of their ideals of life. The founding of Christianity revolutionized men's ways of thinking and ideas of what was most worth while. Education was placed under the care of the Church; its promoters were the Church Fathers, and its ideal the power to defend and explain the most subtle and abstruse theories of the Scriptures. The media were almost exclusively Latin and Greek, and the methods arbitrary and dictatorial. Independent thought was discouraged.

As in the case of the early Christians, the ideal of the later system of the School Men was determined by the ideals of the times. Generally speaking the system falls into three divisions: monastic, secular, and knightly education. The monastic course embraced the seven liberal arts: Grammar, Logic, Rhetoric, Arithmetic, Geometry, Astronomy, and Music. The emphasis on formal logic produced a class of scholars unequalled for their skill in reasoning on abstruse points of theology. The system was one-sided, but it was effective in producing the sort of men demanded by the times, and has exerted a remarkable influence even to the present day.

In distinction to this system, secular education aimed to fit men for the world—for trades and occupations, for commercial and industrial life. Under John Sturm, one of the great figures in the whole history of education, a foundation was laid which later became the basis for a graded system of instruction which in time shaped the curricula of English, German, and American schools for more than three hundred years.

The object of knightly education was to fit youths for adventure and war, to teach them to be loyal to their sovereign, truthful and courteous to women. The ideal of life was the knightly hero, and the love of glory was the chief incentive to action. From the standpoint of its influence upon later systems knightly education is of little importance.

(b.) The Realists. In marked contrast to the humanistic ideals were the theories of the Realists. The rise of Francis Bacon, the originator of the inductive system of education, marks the beginning of this school. His theories were eagerly received by vigorous thinkers and for centuries educational reformers went back to them for guidance and authority. Among these was Comenius, the founder of the modern method of instruction. He applied the inductive method to the teaching of children, grading his lessons and adapting them to the capacities of his pupils. These principles were later elaborated into a complete pedagogical system upon which our own is largely built. Some of his tenets were that education should aim at the development of the whole man, that it should be made agreeable, that it should proceed from the concrete to the abstract, the simple to the complete, the near to the remote.

(c.) Naturalism. For years after the death of Comenius educational leaders did little more than elaborate and expound his theories. The eighteenth century was a time of political, social, and religious discontent and reformers made little headway against the humanistic system which still obtained in the schools. Among those, however, who succeeded in impressing themselves upon the age were Locke, Rousseau, and Pestalozzi. Locke emphasized the need of physical education, and laid stress also on moral and religious teaching. Rousseau, through the popularity of his *Emile,* was one of the most influential reformers of his age. He advanced but few new principles, but from the fact that he popularized many old ones he deserves recognition and careful study. It is with Pestalozzi, however, that naturalistic education may be said to begin. He laid down the principles of which our present system is only an enlargement. For instance, we concern ourselves now with child study, the subject matter of education, methods of teaching, and the co-ordination and correlation of studies. All of these problems are set forth by Pestalozzi and solutions according to his theories are worked out.

2. Schoolroom Management, or Practical Pedagogy. A glance at the table of contents of any text on this subject will suffice

to show how varied and extensive are the range of topics it may cover. A recent book, for instance, begins with a chapter on the site and location of the school building, the choice of seats, the arrangement for lighting, heating, and ventilating. It proceeds with a discussion of the qualifications essential to a successful teacher, taking up such points as personality, health, social influence, the value of friendships, the advantages of travel, and the benefits of attendance upon institutes, conventions, and lectures. Then follow several chapters dealing minutely with such topics as the arrangement of programs, the order of recitations, the conducting of examinations, etc.

3. Contributions by Prominent Educators. What is being written on pedagogy at the present time varies greatly. Everyone who has a teaching experience has naturally evolved some theories of his own.

Pedo'meter, an instrument by which one may determine the distance he walks. It is about the size and shape of a watch and can be carried in the vest pocket. The train of wheels controlling the pointer on the dial is caused to move by a lever which releases one tooth with the jar occasioned by each step. So that the indicated distance shall be accurate, it is necessary to regulate in advance according to the average length of steps. The distance is read directly from the dial.

Pedro. See BRAZIL.

Peekskill, N. Y., an industrial town that also has a considerable historic interest, is on the east bank of the Hudson River and on the New York Central & Hudson River Railroad, 41 miles north of New York City. Thus it is situated immediately below the Highlands of the Hudson. The manufacturing plants of Peekskill produce hats, underwear, fire brick, stoves, oilcloth, yeast and various metal products.

Notable among the buildings and institutions of Peekskill are the Field Library, Saint Joseph's Home, House of the Good Shepherd, Saint Mary's School, Helping Hand Hospital, Peekskill Military Academy, and good public and private schools, Depew Park adds to the attractiveness of the city.

Peekskill was settled by the Dutch in 1764, and was named in honor of a Dutch navigator, Jan Peek. The Robinson House, occupied by Generals Putnam and Parsons in 1778-79, and by Arnold the year following, still stands. Arnold was at Peekskill when the news of Andre's capture reached him, and the captor, John Paulding, is buried here. Population in 1920, 15,868.

Peel, Robert (1788-1850), a prime minister of England. He was born in the neighborhood of Bury, Lancashire. His father and his grandfather before him were wealthy cotton spinners. Young Robert was educated at Harrow, and entered Christ's Church, Oxford, as a gentleman commoner. He studied hard and stood first in classics and mathematics. Though distinguished for his political life he never lost his love for books, and in 1837, when elected lord rector of Glasgow University, his inaugural speech was devoted to praise of the classical education. In 1809 he entered Parliament. The generation of Pitt, Fox, Burke, and Sheridan had done its work.

He rose rapidly. At the age of twenty-five he was secretary for Ireland. He was twice prime minister. For forty years his name was connected with every public measure of importance. He was a Tory in politics. He merged the remnant of the Tories in a new political party known as the Conservatives. He opposed the Reform Bill which extended the right of voting; but, like a politician, accepted the passage of the act in good faith. Sometimes his course was dictated by his own feelings and opinions. Sometimes it was shaped by the evident wishes of the people. He advocated the emancipation of the Catholics, freedom of religious worship, free trade, the encouragement of agriculture, and improvement by loans of public money. His service in reforming the Corn Laws is noted in a separate article. He brought about reforms in the police systems both of Ireland and England. The nicknames of "peelers" and "bobs," by which the police of London are known to this day, are mere plays on the name of Robert Peel. In foreign affairs, he was a friend of the people. The Napoleonic wars came to a close soon after he entered Parliament. It was Peel's policy

to keep out of foreign wars. In his lifetime he declined to be made a peer. He was mortally injured by a fall from a horse. The nation would have laid him at rest in Westminster Abbey, but it was his will that he should be buried in the parish church at Drayton.

Peeping Tom of Coventry. See GODIVA.

Peepul, or **Botree,** the sacred fig tree of farther India. It is closely related to the famous banyan. It is held in veneration by the priests of Buddha, and is planted around his temples. An ancient tree of this sort in Ceylon is said to have been planted 288 B. C. There is reason to believe that it is over 2,000 years old. It is certainly the oldest tree in Asia. The people believe that it was grown from a branch of the very tree under which Buddha himself reclined. It is guarded with the utmost veneration. As fast as they fall. the leaves are carried away as souvenirs. No impious hand or sacrilegious knife is allowed to reach its branches.

Pegasus, in Greek legend, the winged horse of the Muses. He arose from the blood of the Gorgon Medusa when she was slain by Perseus. The myth of Pegasus is connected with that of Bellerophon. When the latter was considering how to meet the monster Chimaera, he was advised to sleep in the temple of Minerva. The goddess gave him a golden bridle, which, on awakening, he found controlled Pegasus. He mounted the steed and overcame the monster. Bellerphon became too much elated over his victory, so Jupiter sent a gadfly to sting Pegasus. The horse threw its rider, who became lame and blind in consequence.

Peggotty, the name of several characters in Dickens' *David Copperfield*. Clara Peggotty is David's nurse in childhood and his faithful friend always. She marries Barkis, famous for his laconic proposal, "Barkis is willin'." Her brother, Mr. Peggotty, is the uncle of Little Emily, in search of whom he wanders on foot through many lands. Ham Peggotty, nephew of Mr. Peggotty, gives his life in the great storm in an effort to save a shipwrecked crew. These three are among the finest examples of Dickens' power to portray the true nobility of character found among plain and humble people.

Pekin, Ill., the county seat of Tazewell County, is on the Illinois River and on the Chicago & Alton, Atchison, Topeka & Santa Fe, Illinois Central, and other railroads, 163 miles southwest of Chicago. The city is also served by river steamers.

The industrial interests of Pekin are extensive, and include manufactories of stoves, boilers, farm implements, corn products, wagons, bricks and tile, organs and lumber products. In the vicinity are productive coal mines.

Interesting features of the city are Mineral Spring Park, Federal building, library and public schools, and court house. Pekin's inhabitants numbered 12,086 in 1920.

Peking, or **Pekin,** the capital of the Chinese Empire. The name is derived from *Pei,* north, and *king,* capital. The city is situated on a plain near the Hun-ho. It is about forty miles within the Great Wall, one hundred miles from the coast, and about eighty miles from Tientsin, its port, farther down the Hun-ho. It is two thousand miles from Hong-Kong, and half as far from Shanghai. The fortieth parallel of latitude runs near Peking and Philadelphia. The climate resembles that of Cincinnati.

Although the starting point for an extensive caravan trade with Mongolia, Siberia, Russia, and Central Asia, Peking is an administrative and residence, rather than a commercial city. The original city, still known as the Tartar or North City, is about four and one-half miles square. It is surrounded by a wall eighteen miles in circuit. The wall is sixty feet thick at the base, fifty feet high, and forty feet wide at the top. Horsemen may make the ascent by means of slopes within. At intervals of sixty yards, square towers project fifty feet. The wall is faced with brick, laid firmly in clay and cement. There are nine gates. The entire wall is surrounded by a ditch. The Chinese consider Peking the oldest and most sacred city in China.

In 1543 a second city, about twelve square miles in area, having the form of an oblong, was built on like a lean-to across the southern end. It is surrounded by a

wall thirty feet high, similarly built and similarly fortified. The two cities are separated by the south wall of the old city. It is pierced by three gateways only.

Seen from the walls, the old north city is a series of groves and gardens, half hiding the gay red, blue, green, and yellow tiled roofs of the temples, mansions, and palaces. At the very center, protected by inclosures within inclosures, like a temple surrounded by a court and an outer court, lies the "Purple Forbidden City," in which stands the emperor's palace. Here, in halls unsurpassed for size and barbaric splendor, the "Son of Heaven" gave audience to prostrate ambassadors from tributary states and heard the report of his ministers. Only the highest dignitaries lived in the Forbidden City. Its wall is faced with yellow tiles, the royal color.

Around this is the inclosure known as the Imperial City, the city official, where imperial business is transacted. Of late, Chinese merchants and tradesmen have been permitted to crowd in. Outside of the Imperial City, but within the outer walls of the city, lies a general residence and business section. This and the southern city contain densely inhabited quarters and business streets, as well as large spaces occupied by gardens.

The total population of Peking is about 1,300,000. Since 1858 foreign ministers, representatives of other governments, not missionaries, have been permitted to reside in Peking. Other foreigners are permitted to visit if provided with passports, but residence and trading are forbidden.

There are several railways. Coal formerly carried from the mines on the backs of camels is now brought by rail. The supply of water is abundant. The system of drainage is crude and horribly offensive. The streets are wide, unpaved, and muddy or dusty according to season. A species of falcon is said to do the work of the city scavenger.

On early morn of the 22nd day of December, the shortest day in the year, the emperor climbed a marble tower 150 feet high, the top of which is ninety feet in diameter. It is paved with nine circular rows of marble blocks. The outer row contains nine times nine, or eighty-one blocks, the inner row contains nine blocks. The center piece is a perfect circle. On this circle, surrounded by nine bands or circular rows of marble, by the circular walls, and by the great horizon, the emperor knelt and besought Shang-ti for a return of the sun for seed time and harvest. There are many temples in and about the city. The famous Peking Bell weighs sixty tons. It is fourteen feet high, thirty-four feet in circumference at the rim and is nine inches thick. It is struck with a wooden beam by the night watch and gives notice by a deep boom of the passage of the hours.

The buildings are of one story, of painted brick, red, blue, and green. Along the streets booths and awnings shelter the tradesmen's stock. Piles of goods attract the eye. Gay streamers, flags, bunting, and Chinese sign poles in red and gilt serve to advertise. The barber gets out into the street with his razors, scissors, and stool; the cook thrusts the handle of his huge umbrella in the sand and fires and stews in public; the peddler calls his wares; the fortune teller proclaims his own virtues; the policeman goes up and down, using his whip and adding to the babel of sounds. "By day and by night, by the light of the sun, or by the illumination of torches and paper lanterns, the roar of these great thoroughfares is incessant; shopkeepers, peddlers, mountebanks, quack-doctors, passengers on foot or on horseback, each and all contributing to the general hubbub." The residents of Peking are vociferously engaged in making a living apparently from each other. The city is far from neat. It is ill drained and unsanitary.

Although much attached to the ways of the past, Peking is adopting European customs. Twenty-five years ago a man seen reading a newspaper was considered a follower of "western devils." There were in 1923 some twenty-five daily newspapers published in Chinese.

The following account of the foreign or legation portion of Peking is taken from an article by a well known American journalist on the city of Peking, its appearance and customs, before the establishment of the Chinese Republic.

Stand with me beside the great tower above the Gate of Chien Men and look down upon the

home of Uncle Sam in Peking. We are in the center of the wall which separates the Chinese and Tartar cities and in the very heart of the Chinese capital. The Legation city lies right below us. We are sixty feet above it and high over the vast mass of low tiled buildings which form the two sister cities. Turning to the south, we look over business Peking, with its thousands of Chinese stores, and beyond it can see the Temple of Heaven and agriculture, where the little emperor gets down on his yellow knees and prays for his people. It is there that he sacrifices, and there he starts the spring plowing for the nation.

Now let us turn to the north. We are facing the huge Tartar city. Its residences are almost hidden in a forest of low trees, but the temples show out here and there and the Imperial City is right at our front. The legation quarter bumps up against it, and Uncle Sam's home adjoins the wide road which leads to the Pink Forbidden City, which is in the center of the Imperial City. It is there that the baby emperor lives, and there, surrounded by countless yellow servants and 3,000 pig-tailed eunuchs, he is now squalling for his bottles and nurses. That American marine at his guardhouse beside us could, by lifting his rifle, send a ball into the palaces, and the south-central gate, which leads to them, is not 1,000 feet from where we are standing. See how the yellow tiles of the palace roofs blaze under the sun and the towers of the great gates stand out against the blue sky. That road just below us, which hugs the American legation, goes on to the palaces. It is the chief path of the officials on their way to visit his majesty, and they must walk under Uncle Sam's walls a part of the distance.

Now turn your eyes to the foreign city, the Legation City, which extends along this wall. It is perhaps a mile long and half a mile wide, forming a rectangle in the very heart of official and business Peking. This massive wall, as high as a four-story house and so wide that fifty soldiers could march abreast upon its paved highway, is the southern boundary.

What would you think of a great armed camp, filled with ammunition guarded by foreign soldiers and surrounded by walls, in the very heart of London, Paris, Berlin, or Washington? That is what the Legation City is in Peking. The rectangle I have described is made up of many walled compounds. Each legation has its own compound or grounds; and each set of grounds its own walls about it. The walls about the American legation are at least twelve feet in height, and the walls of some of the others are so wide that the soldiers march upon them. The entrances to the compounds are through great doors which are barred after nightfall, and in front of each door a soldier stands guard. Some of the entrances are beautifully ornamented with huge marble lions on pedestals. The soldiers usually stand between the lions or just outside and one sees uniform after uniform as he walks through the streets. The greatest nations of Europe have their representatives here, and the soldiers of each legation have their own dress. One sees the Cossack in his fur cap, long coat and high boots; the Japanese in khaki; the French officer looking as though he came from a bandbox, and at the British legation the bare-kneed Highlanders who march to the sound of the bagpipes as they go through the streets. In all, there are more than 1,800 soldiers and officers in charge of this camp. They are tried men and ready to shoot at command. Each legation has quarters for its soldiers and each has its own ammunition and guns, as well as stores of food in case of a siege.

Pelee, Mount. See MARTINIQUE.

Pelican, a family of maritime and fresh water fish-pursuing birds. They nest and feed in colonies. The white pelican breeds from Minnesota northward and winters on the Gulf. It is a magnificent bird, sixty inches in length, with black wing coverts and white, snowy plumage. Unlike the cormorant the pelican is fond of shallow water. A minnow or fish is caught, tossed into the air, and caught again head first, when it slips into a deep pouch under the lower mandible. This pouch serves to carry fish to the nest or on a journey. It is a place of storage,—not a crop as many have thought. See CORMORANT.

Pellagra, (Italian, *pelle agra,* burning, or smarting, skin), a chronic nonhereditary, noncontagious and often fatal disease, the origin of which is as yet unknown, though the most popular theory is that it is caused by eating corn meal in which putrefaction occurs in warm weather.

HISTORY. Pellagra was first noticed in Spain in the early seventeenth century, soon after the introduction of Indian corn from America. In 1735 a Spanish physician, Gaspar Casal, wrote a paper on the subject, but did not publish it until 1762. Previously, a paper, based directly on Casal's writings, was printed in the *Journal of Medicine,* Paris, in 1755. Casal called the disease *mal de la rosa* (probably from the red blotches that are usually the first indication of the presence of the disease), while the name *pellagra* originated in Italy. Soon after the discovery of the disease in Italy, it spread to France, the Balkan states, Rumania, Hungary, Egypt and England; it was many years later that the malady was first noticed in the United States, but it has rapidly increased here.

DESCRIPTION. Usually, pellagra appears as an erysipelatous eruption on the

ticable to separate the moldy part of the kernel, usually the germ, from the sound portion, thereby producing sound meal and an inferior, damaged grade of meal much sought by the poor because it is cheaper. The peasantry, far from tidy, aggravate their ills by allowing the porridge which they call *polenta* to stand around until it sours. These aggravating dietary conditions have spread the disease among the poor so that the pellagra is called *mal de la miseria,* the disease of poverty.

To say that no headway has been made in controlling the disease would be incorrect. It has been found that a change to proper diet affects a cure in the young and in cases that have not gone too far. In 1907 there were in Italy twenty-two hospital-asylums for acute cases and 591 diet-kitchens or dietary restaurants for the poor. A nominal charge is made for food. The fare consists of soup, meat, vegetables, bread, wine, milk, and cheese, and patients are enjoined to eat no other. Lunches have been provided for school children with excellent results.

In spite of all that has been done the cause of pellagra is a medical mystery. Those countries are free in which the inhabitants have a custom of oven-drying their corn as soon as it is harvested. The Mexicans are free; they hull their corn with lye or lime water and moreover bake the dough in griddle cakes or *tortillas.* Rotten *polenta* is the diet which breeds pellagra, but why does it? An Italian scientist, by the name of Lombroso, a name worthy to stand with Koch and Pasteur, has been on the trail of pellagra since 1864, and has not (1909) solved the question. He has searched for a disease germ like that of yellow fever, diphtheria, or the bubonic plague, but cannot be sure that he has found it. He has followed up the theory that corn is a food on which some disease germs live, but cannot get satisfactory proof. He has separated a poisonous principle from moldy corn and has given it to animals. This poison makes hens dull and droopy, or makes them walk backward lifting the foot high at each step; it gives frogs the lockjaw; it paralyses guinea pigs; it throws mice into convulsions; it kills cats and dogs; it gives healthy persons symptoms of the disease, but in no case have this indefatigable man and his friends been able to produce pellagra by means of the poison pure and simple. Rotten polenta they have tried over and over on peasants, workmen, and convicts; its effects are certain, but the poison extracted from the same *polenta* and fed with other foods does not produce the effect. The effort of these investigations to connect the cause of pellagra with zea, which is the botanical name of Indian corn, has given them the name of zeists. Those who look for the cause of pellagra independent of *zea mays* are called anti-zeists.

In 1900 an Italian expert advanced the theory that pellagra is due to a germ communicated by the sting of a gnat.

Whatever the cause of pellagra it is a nervous disease. It manifests itself in the most contradictory ways. It causes loss of appetite and excessive hunger. One patient is stupid; another cannot sleep. One person is even morosely silent—stupid; another chatters unceasingly. There is a saying in Venice to the effect that pellagra can give six ills. It drives one crazy, it draws one backward, it bends one over, it gives dizziness, it gives hunger, and it gives a rheum of the skin. The last named affliction is loathsome and painful beyond description. The rheum attacks the hands, the feet, the face, the neck, back, or breast,—any portion exposed to the sun. Peeling after peeling takes place until the skin is gone and the livid, red flesh is exposed. The tongue and throat are attacked in like manner. The patient screams and sinks in prolonged agony, unable to die and unable to obtain relief from the torture of "swallowing live coals."

America, wont to regard pellagra as a far-off evil incident to conditions not prevalent in this country, has been astonished, not to say horrified, to find that it exists in a virulent form in this country, and that it bids fair to become an epidemic. In 1864 a case was reported by Dr. John Gray of Utica to a national convention of superintendents of insane asylums. Superintendent Tyler of Massachusetts spoke of a similar case that had come under his observation. In 1883 another case was reported, and in 1902 a case was reported from Georgia. It appeared about this time

skin, showing first in spring and continuing until autumn, disappearing in winter. At first it is almost always confined to those parts that are constantly exposed. In the spring following its first appearance it returns with renewed violence. In almost every instance the disease is preceded or accompanied by lassitude, moroseness, melancholy, hypochondriasis and suicidal mania. As time goes on the period of winter dormance grows shorter until finally the disease is constantly present. A permanent crust appears on the skin, a thick, livid crust that sometimes turns black, giving the victim a hideous aspect. Physical resistance diminishes; the sufferer loses the use of his lower limbs, and at the same time is overcome by headache, nausea, colic and other disorders. The head burns and the sensation of burning spreads until the body is encompassed. The victim is finally reduced to the appearance of a mummy.

TREATMENT. Pellagra seldom attacks young children, and in Europe it appears chiefly among the poor, whose diet is restricted, sometimes consisting of corn only. The pellagrin usually responds to a change of diet and improved sanitation accompanied by frequent baths and douches. A diet of fresh milk, very lean meat, eggs and legumes assisted by a tonic is recommended; all corn products must be avoided. Often in severe cases a transfusion of healthy blood is effective.

The disease became so prevalent in Italy in 1827 that it was estimated that fully one-third of the Italian population suffered from it. Improved methods of combating it have resulted in improved conditions. In the United States pellagra is confined to the southeast. The first deaths from the malady were reported in 1900. Statistics compiled at a later date show that Georgia suffered heaviest; but the same figures show a decreasing death rate on the basis of the number of cases reported.

Pelletier, Louis Philippe (1857-), a Canadian statesman, was born at Trois Pistoles, Quebec, and studied at Sainte Anne College and at Laval University. Called to the Quebec bar in 1880, he practiced in the city of Quebec until elected to the provincial legislature. During 1896 and 1897 Mr. Pelletier was attorney-general of the province, and in 1911 he was elected to the Dominion Parliament. He was made Dominion Postmaster-General in the same year, and it was in the discharge of his duties while in this office that Mr. Pelletier rendered his greatest services to Canada. The first and most valuable of these was the organization of an adequate rural mail delivery system, and the second with the lowering of the postal rate to France.

Peloponnesus, the main peninsula of southern Greece. The name is derived from Pelops, a hero of Greek mythology. He was the grandson of Zeus and the brother of Niobe. The peninsula comprised Achaia, Elis, Messenia, Arcadia, Laconia, and Argolis. The leading cities were Sparta, Corinth, Argos and Olympia. A contest between Sparta and Athens for the leadership of Greece, extending from 431 to 404 B.C., is known as the Peloponnesian War. It resulted in the triumph of Sparta and the destruction of the long walls of Athens. The peninsula is now known as the Morea. It is a mountainous region of about 8,300 square miles. See GREECE.

Peltry. See FUR.

Pemberton, John Clifford (1814-1881), an American soldier. He was born in Philadelphia and was graduated from West Point in 1837. He took part in the Seminole War in Florida in 1837-9; he served under General Worth and distinguished himself in the Mexican War, becoming major after the battle of Molino del Rey. During the Civil War he served in the Confederate Army, before the end of 1862 becoming lieutenant-general. He encountered and after a brave defense was defeated by General Grant at Baker's Creek, Big Black Bridge, and Vicksburg. After the fall of Vicksburg he resigned his commission; but accepted the rank of lieutenant-colonel in 1864 and served to the end of the war. He spent the last years of his life in Virginia and Pennsylvania.

Pembroke, Ontario, the county town of Renfrew County, is on the Ottawa River and on the Canadian Northern, Grand

Trunk and Canadian Pacific railroads, 105 miles northwest of Ottawa. Hydro-electric power is available, and is used by manufacturers of steel furniture, box shooks, edge tools, electric specialities, lumber, matches, leather, gloves, moccasins and foundry products.

There are six public schools in Pembroke, a convent school, a library, two hospitals and several good hotels. Twelve miles west of the city is the Algonquin National Park. Population, 1921, 7,875. utation. According to recent statistics the annual value of gold pens manufactured in the United States is about $700,000; the value of steel pens, is about $500,000. In addition, fountain and stylographic pens were reported to the value of $2,000,000. The latter item is increasing rapidly.

Pemmican, a sort of food prepared by the northern Indians. Meat, chiefly that of the buffalo, was cut into bits and boiled into shreds. It was then seasoned with berries, flooded with the boiling fat of the animal, and sealed up in skin bags. This highly nutritious condensed food was taken on long journeys. It was a staple article of diet among the Indians of the Northwest, the trappers, Red River voyageurs and the drivers of the creaking trains of fur-laden Red River carts on their annual trip from Manitoba to St. Paul. Pemmican is prepared still by the Eskimo Indian. He dries his strips of musk ox, seal, venison, bear's meat, or any kind of game, then pounds it into shreds and packs it in boiling fat in skin sacks. Pemmican prepared in this way keeps indefinitely. These sacks of pemmican are the standard food on long journeys. A chunk of frozen pemmican and a can of hot tea form the regular meal of an Arctic explorer.

Pen, a well known instrument used for writing with ink. The point is known as the nib. The earliest implement used for writing was probably the stylus, a mere pointed needle of metal, bone, or ivory. A pen made from a joint of the hollow stalk of the calamus or reed was the implement in use by the ancient writers. It is considered the ancestor of the modern pen. Hollow joints of a small bamboo were used for the purpose also. The use of the quill or feather of the swan, goose, crow, etc., was known, it is believed, at an early date. The first mention of the quill in literature, however, dates from the seventh century. About 1809 an English inventor hit upon the idea of cutting up quills into nibs. He also invented a machine for the purpose. This rendered the mending of quill points unnecessary. The public took to the idea kindly, and thus became accustomed to the notion of a nib and a holder in two separate articles. Various patents were granted for gold and steel pens. About this time also a steel nib was placed on the British market at a retail price of a dollar and a quarter each. The making of steel pens developed into an industry first at Birmingham between 1830 and 1840. That city is still the center of the British pen trade. Joseph Gillott, whose name is associated with the perfection of the steel pen and who made a fortune in its manufacture, was originally a knife grinder of Birmingham. The making of gold pens has kept pace with the use of steel. They are tipped usually with iridium, as gold wears too rapidly to be serviceable.

The making of steel pens, like that of needles and pins, is accomplished almost wholly by machinery. Steel of the finest quality is first rolled into sheets and cut into ribbons. After it has been properly annealed, cleaned, and reduced to uniform thickness, the pens are cut out by a die. They are now called blanks. The central perforation and the shoulder slits, if any, are now made by another machine. The flat blanks are then passed into a press and stamped with the manufacturer's name and other points desired. After this they are curled by means of rollers into a semi-cylindrical form. They are then tempered, plunged in oil, roasted over a fire until they obtain a dull blue color, and scoured and polished in large cylinders in which they are tumbled about with sand. The points are ground on a small emery wheel, first lengthwise, then across the nib. The slitting of the nib is about the last operation, after which the pens are polished, roasted, and sometimes varnished with a solution of shellac. Birmingham pens rank high. French pens have an excellent rep-

utation. According to 1905 statistics the annual value of gold pens manufactured in the United States is $692,029; the value of steel pens, $473,847. In addition, fountain and stylographic pens were reported to the value of $2,082,005. The latter item is increasing rapidly.

Pen Name. See PSEUDONYM.

Penates, pe-nā′tēz, in Roman mythology, the household gods who were supposed to guard the welfare and prosperity of the home and family. The word Penates is from *penus,* the innermost part of the temple. The head of the family was priest to the Penates of his own house. The images of the Penates were kept in the inner or central part of each home. In case of a family removing to another home, or if the home must be deserted in time of danger, it was the first care of the family to take with them the Penates. Each city had also its Penates, guardians of the empire. The Lares were included in the term Penates, although the expression "Lares and Penates" is common. See LARES.

Pencil. See LEAD-PENCIL; SLATE.

Pendennis, The History of, a novel by William Makepeace Thackeray, published in 1848-1850. It was Thackeray's second long story and was begun immediately after the conclusion of *Vanity Fair.* It was published in installments. The first number, November, 1848, appeared in a bright yellow cover bearing the full title—*The History of Pendennis, His Fortunes and Misfortunes, His Friends and His Greatest Enemy.* Below the title appeared a drawing by the author representing a youth for whom the personified powers of good and evil were contending. Pendennis is rather more simple in plot than Thackeray's other novels. The development of the character of Arthur Pendennis forms the theme of a story believed to be autobiographical. Pendennis is a thoroughly human youth, good-natured, generous, but faulty.

Pendulum, a weight hanging from a point of support in such a way that it is free to swing to and fro. A vibration is the trip from the highest point on one side to the highest point on the other. The length is the distance from the point of support to the center of mass. When a small string or light wire is used to suspend a heavy bob, the length is practically, but not quite, the distance from the point of suspension to the center of the bob. The time required for a vibration depends entirely on length, and has nothing to do with the kind of material, weight, or the length of arc through which the pendulum swings. This may be tested by watching a child's swing. It swings to and fro just as many times per minute when it goes high, as when it goes low. It makes no difference whether one child or two are swinging.

These facts are expressed in laws:

1. The time occupied by the vibration of a pendulum is independent of the length of the arc.

2. The time of one vibration of a pendulum varies as the square root of its length. Multiplying the length of a pendulum by four multiplies its time by two. If one pendulum be nine times as long as another, it will be three times as long in completing a vibration.

Since the time of a given pendulum does not change it is of great service in regulating the rate of motion of the works of a clock. Do not get the idea that the pendulum "makes the clock go." The spring, or the weight, does that. The balance wheel in a watch serves the same purpose as the pendulum in a clock—it keeps the motion uniform. At the upper end of the pendulum is an inverted V-shaped piece with tips touching a toothed wheel known as the escapement wheel. With each swing of the pendulum one tooth of this wheel is released, and enough impetus given the pendulum to keep up its motion.

It has been found by experiment that a pendulum 39.1 inches long will vibrate once per second at the sea level in the latitude of Boston. The greater the force of gravity, the less the time of vibration. If this standard pendulum be carried up a mountain where the force of gravity is less, it will take a little more than a second to a vibration, and must be shortened slightly to keep correct time. The same is true if it be carried toward the equator, while at the sea level very far north or south, being somewhat nearer the center of the earth, the action will be quickened and the pendulum must be lengthened slightly to keep correct time.

Another difficulty to be overcome is the lengthening of the pendulum rod in hot

weather on account of the expansion due to heat and the corresponding shortening in cold weather. To obviate this change two plans have been devised. In a so-called gridiron pendulum a number of parallel rods are connected in a frame in such a way that the lengthening of one-half of them shortens the pendulum while the lengthening of the other half lengthens it by an equal amount. In a mercurial pendulum the bob is a vial of mercury. As heat expands the rod, thereby lowering the bob, it also swells the mercury, thereby raising its center of gravity. This leaves the length of the pendulum unchanged. See CLOCK.

Penelope, pe-nĕl′ō-pe, in Greek legend, the wife of Ulysses and mother of Telemachus, who was but an infant when his father left home for Troy. During the ten years' siege and the years that followed before Ulysses reached home again, Penelope, who was a beautiful woman, had many suitors. They tried to persuade her that her husband was dead. She promised to choose a husband as soon as she had finished the weaving of a web to be used for the funeral canopy of Laertes, her husband's father. She worked at the web each day, but at night unraveled all she had woven. Thus Penelope's web has become proverbial as a thing constantly in process of construction, but never completed. See ULYSSES.

Penetanguishene, Ontario, an industrial town and port of entry, is situated at the southeastern end of Georgian Bay and on the Grand Trunk Railroad, 102 miles north of Toronto. The town is a resort popular with Canadians and Americans. There are factories producing box shooks, leather, gasoline engines, stoves, motor boats, pails, tubs, bricks, flour and finished lumber. There are good primary schools and a high school, a library, a general hospital and a hospital for the insane, and two spacious parks. In 1921 the population was 4,037.

Peninsular War, a series of campaigns against Napoleon extending from 1808 to 1813 in the Iberian peninsula. It resulted from the attempt on the part of Napoleon to place his brother Joseph Bonaporte on the throne of Spain. The English under Sir John Moore were repulsed, and their leader killed, whereupon Wellesley, afterward the Duke of Wellington, took command. By 1810 he had cleared Portugal of the French, and taken a strong position in Spain. Successes the following year alternated, but in 1812 the decisive battle of Salamanca went against the French to be followed the next year with their defeat at Vittoria.

Penguin, a name once applied to the great auk, but transferred to a somewhat similar bird found in the southern hemisphere, particularly in Patagonia and about the Cape of Good Hope. There are twenty species. The wings of the penguin are reduced to mere flippers used in diving only. The common penguin of Patagonia is about three feet in length and has a stout, ungainly body with a small head and pointed bill. Its upper parts and flippers are covered with black, scale-like feathers. Its under parts are white. The penguin is at home in the water. By means of its flippers it dives like a loon and pursues fish with all the speed of a cormorant, but it is exceedingly awkward on land. The legs are placed farther back on the body than those of a duck, so that it stands almost upright on land, resting partly on a stiff tail. The penguin is inconceivably more awkward than the duck. See AUK.

Penitentiary. See PRISON.

Penn, William (1644-1718), an English Quaker, the founder of Pennsylvania. He was born in London. His father was an admiral in the English navy. His mother was a Dutch woman of good family. The admiral, evidently somewhat of an adventurer, served Cromwell with vigor and changed over to the Stuarts so promptly at the oncoming of the Restoration as to obtain place and reward. Young William was entered as a gentleman commoner at Christ Church, Oxford. He entered college with Puritan ideas, and joined a body of young men who resented and opposed the efforts of authorities to make all students conform to the observances of the English Church. Two or three facts in this period of his life stand out. He was noted as an athlete. He was one of a party that fell upon some students who were wearing surplices and tore off the hated vestments.

Penn took a prominent, even a muscular, part in Quaker meetings. On one occasion, at least, he showed his zeal for the faith by pitching out headlong a rowdy who undertook to create a disturbance.

At death Admiral Penn left his son William a considerable income, a landed property, and a claim against the king for $72,000 on account of money loaned in time of need. With a fortune at command Penn began to look about for ways and means of colonizing the Quakers in the New World, where they might be free from annoyance. With some friends he bought New Jersey from its English proprietors. In 1681, in consideration of the debt owed his father, he obtained from the king a grant of land on the north of Maryland running westward from New Jersey, "on the west limited as Maryland, northward as far as plantable." The latter phrase was interpreted as three degrees. By virtue of his charter Penn was made owner and governor of this vast tract, to be known as Pennsylvania in honor of his father.

Penn was placed really in the position of a "constitutional king." He had great authority, but the settlers were also given rights (as in all colonies) to share in the government. He set to work colonizing his new possessions, and drew up a constitution for the government of the settlers in which he still further limited his own powers. He provided for a council or legislature of seventy-two members, twenty-four to be chosen each year. All offices except that of governor, were filled by popular election. Under the Great Law of Pennsylvania, passed by the first assembly, religious toleration was granted to the extent that any Christian was permitted to vote, hold office, and enjoy his own form of worship unmolested. Disputes were to be settled by arbitration instead of by lawsuits. In October, 1682, Penn visited the New World. The assembly met at once.

In the following month he made a treaty with the Indians. The details are not known. Benjamin West, the painter, has followed tradition in representing the conference as held under a spreading elm tree. "We meet," Penn is represented as saying, "on the broad pathway of good faith and good will. No advantage shall be taken on either side, but all shall be openness and love." At all events, Penn and his friends bought lands from the Indians honorably, and were not involved in the wars that devastated other colonies. This was the only Indian treaty "never sworn to and never broken." The elm under whose branches the treaty was made was blown down in 1810. A small monument marks the spot.

After a stay of two years Penn returned to England. When, a few months later, Charles died and the king's brother, James, the Duke of York, an ardent Catholic, came to the throne, Penn became a man of influence. The king desired religious tolerance for the sake of the Catholics. The Church of England was too firmly established to be subverted; therefore King James was glad to recognize dissenters of all sorts. He was pleased to have the support of William Penn, a leading Quaker in his realm, for whom, moreover, he had a kindly feeling. Penn secured the release of 1,200 Quakers who were lying in prison. At the time of Monmouth's rebellion and the Bloody Assizes, he wrote: "About 300 hanged in divers towns in the West, about 1,000 to be transported. I begged twenty of the king." James' reign was short. When he fled to France and William and Mary ascended the throne Penn fell under suspicion on all sides. The Catholic friends of James thought Penn truckled to the new Protestant king, the Protestants distrusted him for his old friendship for James, and the Quakers doubted his steadfastness in the Quaker faith. He was deprived of the governorship of his province. His rents were held back. Domestic sorrow came on him. A favorite son resident at Philadelphia became a notorious profligate. Matters mended somewhat before Penn's death. He acquired standing at court and was restored to the confidence of the Quakers. His fortune was spent, however, in behalf of Pennsylvania. An immense sum was stolen by a dishonest steward.

In 1699 he made a second visit to Pennsylvania, returning again to England in 1701. Penn's relations with Pennsylvania were never wholly satisfactory. Although the colony was founded on a liberal plan and owed its prosperity largely to the paternal influence and wisdom of Penn, little

gratitude was shown. The settlers chafed under the petty rents exacted. They seem to have regarded Penn rather as an overgrown patroon to be shaken off.

Penn died in 1718 and was buried in a quiet churchyard in Buckinghamshire, England. The most touching tribute came from the Indian sachems whom he had known in far off Pennsylvania. They sent a message to the widow of "Brother Onas," and a package of choice beaver skins for a cloak to protect her "while passing through the wilderness without a guide."

In 1790 perpetual squabbles with Penn's heirs were brought to a close by an agreement on the part of the commonwealth to pay an annual sum of $20,000. In 1884 the claims of the Penn heirs were bought off by the state for the round sum of $335,000.

Pennsylvania, one of the thirteen original states of the Union. From its position at the center of the arch formed by the original states, it is known popularly as the Keystone State. The state is rectangular in form, lying between the parallels of 39° 43′ and 42° north latitude. A small projection at the northwest gives the state a frontage of forty miles on Lake Erie. A small area is lost to Delaware at the southeast, where the line is the circumference of a circle having a radius of twelve miles described about Newcastle courthouse as a center. The Delaware River forms the eastern boundary. The boundary on the west is the meridian of 80° 36′ west longitude. The area is 44,832 square miles water included.

Topography. The surface of the state is divided into three areas, the Atlantic coast, the mountain area, and the northwestern region. The mountain area itself consists of a series of parallel ranges of the Appalachians running from the northeast to the southwest. It is about fifty miles in width and comprises perhaps a fourth of the state. It is cut crosswise by a number of channels known as water gaps. They were formed, no doubt, by the rivers themselves. They followed their present courses before the mountains began to rise. As the ranges wrinkled upward, the rivers kept their courses cut down to the present level. The waters of the state lie in three general basins of drainage. They run southeast to the Atlantic, empty into the headwaters of the Ohio, or else they drain into Lake Erie. The principal river is the Susquehanna. The "Blue Juniata" enters the Susquehanna from the west.

Forests. Originally, the state was covered with forests of hemlock, white pine, spruce, oak, poplar, elm, basswood, etc. It was at one time the leading lumber-producing state of the Union, but the wasteful methods pursued by lumbermen and the ravages of forest fires have reduced the output greatly. It is estimated, however, that about one-third of the state is still covered by forests of greater or less value. There is still a good supply of hemlock. In 1900 the total value of forest products for the state was somewhat over $35,000,000. Of late, efforts have been made to reforest some of the rougher portions of the state. Over half a million acres have been set aside as reserves. It is hoped that they may also serve to prevent the recurrence of the disastrous floods for which western Pennsylvania has become noted since the great forests were cut away.

Agriculture. The soil of the state is essentially the product of disintegrated limestone. Where level enough for the purpose of cultivation it is exceedingly fertile. The southeastern part of the state is practically a vast garden. The interlocking ranges of mountains inclose valleys not only of great beauty, but exceedingly productive as well. The northwestern part of the state is well adapted to general farming. Named in order, the chief field crops are corn, oats, wheat, buckwheat, rye and barley. One-third of the buckwheat raised in the Union comes from Pennsylvania.

The raising of potatoes is very important, and the orchards of southeastern Pennsylvania are highly productive. The principal orchard products are apples, peaches, pears, plums, apricots and cherries.

Pennsylvania leads the Middle Atlantic and New England group of states in poultry raising, the poultry including chickens, ducks, geese, turkeys, guinea fowls and pigeons. The fourteenth agricultural census gives $53,709,343 as the value of the chickens and eggs produced

on Pennsylvania farms in that census year. Dairy products have a high annual value; Pennsylvania has more dairy cattle than other cattle, the first being in excess to the number of 322,048 in the last census year. Pennsylvania, like Ohio, raises large numbers of pure-bred horses.

MINERALS. Pennsylvania is the first state in the Union in the production of minerals—coal, cement, clay, iron and petroleum leading. In the output of anthracite and bituminous coal the state exceeds West Virginia, Ohio and Illinois combined. The latest available production figures are—anthracite, 89,636,036 tons; bituminous, 166,929,002 tons.

In 1768 the first anthracite coal was discovered in Pennsylvania, and it was then thought to be too hard to burn. In the next century its fuel value was learned and by 1820 it was coming from the field at the rate of one ton a day. In less than eighty years production had increased to more than 100,000 tons a day.

The Lehigh cement district is one of the most important in the world. Excellent fire clay is found, together with other clays, and Pennsylvania leads in the production of fire bricks and ranks next to Ohio in the making of clay products generally. In slate production it also leads the Union, and valuable deposits of iron, lime, glass sand, limestone, copper, graphite, feldspar and various building stones are found.

In Pennsylvania the petroleum industry originated (see PETROLEUM subtitle *History*), and "Pennsylvania crude" is still the standard by which all petroleum is tested. For many years this state was the only producer, and after petroleum deposits were found in other states Pennsylvania stood first; but since the opening of the great fields of Oklahoma and California the Keystone State has dropped to fourth place. Natural gas for industrial and domestic purposes is still abundant.

MANUFACTURE. An abundance and a variety of natural resources combined with good transportation facilities and accessible markets to put Pennsylvania in second place as a manufacturing state as long ago as the middle of the nineteenth century. Since that time it has ranked next to New York; and though New York had 49,330 industrial plants as against Pennsylvania's 27,793 at the last census, the difference in the total value of their products was but only one and one-half billion dollars.

Since 1756 Pennsylvania has led the Union in the production of iron and steel, and the last state census gave the value of iron and steel as 40 per cent of the total value of manufactures. There were 3,432 metallurgical plants. The greatest steel producing city is Bethlehem. Steel bridges made in the state span rivers in Africa, Australia and other distant places, and Pennsylvania boiler and armor plate is known all over the world. Locomotives, steel railway cars, steel ships and pig iron are other products.

Next in importance is the textile industry, with 1,024 plants when the last industrial census was taken, and a product second in value. The principal textiles are woolens and worsteds, knit goods, silk, felt goods, cotton goods and hosiery.

In the production of high quality finished leather Pennsylvania has no equal; it ranks high in the manufacture of tobacco products, and takes first or a leading place in the making of electrical machinery and supplies, women's clothing, plate and blown glass, surgical instruments and supplies, gold and silver leaf and foil, cutlery, glue, dyestuffs, refinery products, printed matter, sugar, roofing materials and other products the enumeration of which would greatly extend the list.

TRANSPORTATION. Many of Pennsylvania's rivers have been made navigable, there are two good canals, there is a large port on Lake Erie, and there are 12,872 miles of steam railroad and more than four and a quarter thousand miles of electric lines.

The principal railroads operating in the state are the Pennsylvania, Lehigh Valley, Baltimore & Ohio, New York Central, Delaware, Lackawanna & Western, Lake Shore & Michigan Southern, Philadelphia & Reading, Pittsburgh & Lake Erie and the Erie. The important lake

port is Erie. Philadelphia is the chief outlet to the sea and Pittsburgh, Harrisburg and Philadelphia are the principal railroad centers.

CHARITIES AND CORRECTIONS. One of the most progressive states in the Union in the matter of caring for the aged, blind, sick and feeble-minded, Pennsylvania maintains the State Institution for the Feeble-Minded of Western Pennsylvania, Home for Deaf Children, Pennsylvania Oral School, ten hospitals, seven hospitals for the insane, a Soldiers' and Sailors' Home and many other places of refuge.

The correctional institutions include prisons at Philadelphia and Pittsburgh, an industrial reform school and another reformatory.

THE PEOPLE. In 1920 Pennsylvania's population was 8,720,017; of this total, the foreign born represented about one-sixth. The population is 64.3 per cent urban, and is distributed in the proportion of 194.5 to a square mile. Ten Pennsylvania cities have populations of more than 60,000; four have more than 100,000; and the largest, Philadelphia, has 1,823,779. The most conspicuous peoples among the early settlers were Germans(Pennsylvania Dutch) and Scotch-Irish, and the descendents of these are still dominant in the agricultural districts. Owing to its extensive mining and manufacturing interests, employing a large percentage of immigrant labor, there are many Poles, Rumanians, Russians, Austrians and Italians in the state.

EDUCATION. Pennsylvania has from its organization held a leading place in educational matters, setting a splendid example for states of later establishment. The name of Benjamin Franklin (see FRANKLIN, BENJAMIN) is inseparably connected with the educational system of the state. Primary education is free and is compulsory during the full school term for all children from 8 to 14 years of age. In 1920 the state had 42,354 public elementary schools and 954 standard public high schools. In the same year there were 13 state normal schools.

The institutions of higher learning are the Pennsylvania State College, Bryn Mawr, Carnegie Technical University, Lehigh University, Swarthmore College, Dickinson College, Washington and Jefferson College, Temple University, Duquense University, Susquehanna University, Bucknell University, Ursinus College, Haverford College, University of Pittsburgh and Lafayette College. The famous University of Pennsylvania at Philadelphia is not a state institution; it is treated under its heading in this volume.

GOVERNMENT. Pennsylvania is one of the thirteen original states of the Union, but it is governed under a constitution adopted in 1873, after three others had been discarded. The legislature consists of a lower and an upper house with 50 and 208 members respectively. Senators are elected for terms of four years, half of the senatorial body being chosen every two years, and representatives are elected for two years.

Executive power is vested in the governor, lieutenant-governor, secretary of state, attorney-general, state treasurer, auditor and superintendent of public instruction. The secretary of state, attorney-general and superintendent of public instruction are appointed to office.

The judiciary consists of a state supreme court of one chief justice and six associate justices, a superior court of seven judges, courts of common pleas, courts of oyer and terminer and general jail delivery, courts of quarter sessions of the peace, orphans' courts and magistrates' courts. Justices of the supreme court are elected for 21 years, and all other judges for 10 years. Capital punishment is in effect, the sentence being consummated by electrocution. Child labor laws and workmen's compensation laws are in force.

HISTORY. The first white settlement in Pennsylvania was made by the Swedes on the west bank of the Delaware River about 1637. In 1675, when the region passed under English control, there were about 200 families in Pennsylvania. In 1681 King Charles granted the present territory of the state to William Penn. He suggested the name Sylvania, or "forest country." The king prefixed Penn in honor of the grantee's father, who had

been his friend. Penn proceeded to organize the colony on Quaker principles. Although principles of peace seemed somewhat out of place in a country inhabited by savages and bordered by jealous rival colonies, the experiment seems to have succeeded well. Colonists poured in from Wales, England, Germany and Switzerland. The Scotch-Irish, subsequent supporters of Princeton College, were an influential and radically democratic element. The dissatisfied and the persecuted in other colonies migrated to Pennsylvania. Within less than twenty years it contained 25,000 white settlers. The Moravians of southern Germany, adherents of John Huss, formed a large settlement in the vicinity of Bethlehem. They proved industrious and thrifty citizens and contributed not a little to the prosperiy of the colony. Germans from the Rhine came in large numbers. At the beginning of the Revolutionary War there were about 300,000 people in the colony, one-third of whom were Germans. The remainder were pretty equally divided between Quakers and other minor elements. The Moravians, until lately clung persist ently to their own language and peculiar religious tenets, forming an element known as the Pennsylvania Dutch. Although they have been in this country for several generations, there are families, even yet, that speak broken English.

Though a Quaker state Pennsylvania bore an honorable part in the War of the American Revolution. The Continental Congress held most of its sessions, it may be remembered, in Pennsylvania cities.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Land area, square miles	44,832
Water area, square miles	294
Forest area, acres	13,000,000
Population (1920)	8,720,017
White	8,432,726
Negro	284,568
Foreign born	1,387,850
Asiatic	2,386
Chief cities:	
Philadelphia	1,823,779
Pittsburgh	588,343
Scranton	137,783
Reading	107,784
Erie	93,372
Harrisburg	75,917
Wilkes-Barre	73,833
Allentown	73,502
Johnstown	67,327
Altoona	60,331
Number of counties	67
Members of state senate	50
Members of house of representatives	208
Salary of governor	$18,000
Representatives in Congress	38
Assessed valuation of property	$9,498,705,620
Bonded indebtedness	$39,451,110
Farm area, acres	17,657,513
Improved land, acres	11,847,719
Corn, bushels	76,272,000
Oats, bushels	35,283,000
Wheat, bushels	23,850,000
Potatoes, bushels	21,586,000
Buckwheat, bushels	5,175,000
Rye, bushels	3,008,000
Tobacco, pounds	61,320,000
Hay, tons	3,658,000
Apples, bushels	4,161,000
Peaches, bushels	279,000
Wool, pounds	3,443,973
Domestic Animals:	
Horses	539,957
Mules	45,832
Milk cows	897,626
Other cattle	575,578
Sheep	585,902
Swine	1,081,098
Manufacturing establishments	27,973
Capital invested	$6,224,729,968
Operatives	1,135,837
Raw material used	$4,210,408,628
Output of manufactures	$7,315,702,867
Textiles, value	$646,683,000
Anthracite coal, short tons	89,636,036
Bituminous coal, short tons	166,929,002
Coke, tons	6,673,300
Cement, barrels	28,222,100
Petroleum, barrels (42 gals.)	19,289,120
Miles of railway	12,872
Teachers in public schools	44,862
Pupils enrolled	1,608,573

Pennsylvania, University of, a famous institution of higher learning established at Philadelphia as a charitable school in 1740, and largely through the influence of Benjamin Franklin, raised to the status of an academy in 1749. The institution received a charter from the son and grandson of William Penn in 1753, and two years later was rechartered as the College and Academy of Philadelphia. An act of the Pennsylvania legislature had provided for the establishment of a university in 1779, and in 1791 this institu-

tion and the old college were united and called the University of Pennsylvania. In 1872 the university was removed from the center of the city to a beautiful site on the west bank of the Schuykill River.

The university is organized into the college (arts and biology); the Wharton School of Finance and Commerce; the Towne Scientific School, offering courses in mechanical, electrical, chemical and civil engineering; the school of fine arts (architecture, music); the school of education; the Graduate School; schools of medicine, law, dentistry, veterinary medicine; the graduate school of medicine; Wistar Institute of Anatomy and Biology; Henry Phipps Institute, for the study of tuberculosis; laboratory of hygiene and public health; veterinary hospital; the library; the Flower Astronomical Observatory; and the university museum. In 1916 the Medico-Chirurgical College of Philadelphia was merged with the university as its graduate school of medicine, and in 1918 a merger was effected with the Philadelphia Polyclinic and College for Graduates in Medicine.

The university confers the degrees of bachelor of arts, law, music, and science, master of arts and science, doctor of philosophy, dental surgery, medicine and veterinary medicine, and degrees in civil, chemical, electrical and mechanical engineering, and in education and economics.

The University of Pennsylvania is not a state institution, as its property is owned by a privately appointed board of trustees. In recent years, however, it has received regularly considerable sums from the state of Pennsylvania toward its general maintenance, and toward the support of hospitals and other special departments.

In June, 1922, the assets of the university were greater by $29,755,360.00 than its liabilities; in that year the donations were $256,504.00; the real estate was valued at $12,008,239.00, and the libraries, museums, apparatus and furniture at $4,766,489.00. The library contains 500,000 bound volumes and 50,000 pamphlets. In 1922 the faculty numbered 1,100 and the student body 14,545.

Penny, a bronze English coin worth about two cents in United States money. It is the twelfth part of a shilling. Like our cent the face value of the coin is several times the value of the metal in it. The German penny of pfennig is worth one-eighth of an English penny. The penny is worth four farthings British money. The abbreviation d. is from the Roman denarius, a similar coin. The plural of penny is pence. The term penny is used in America also for a cent. The term penny is imbedded in English literature as, "A penny for your thoughts," and "Penny wise and pound foolish."

Pennyroyal, an herb belonging to the mint family. It is a low-lying perennial, much branched, with smaller leaves than have most mints. The flowers are in dense whorls at the angle formed by leaf or branch with the stem. The plant known as American pennyroyal is a mint of another genus. It is a low, upright plant with bluish flowers arranged as in the first-named plant, and with a pleasantly pungent, aromatic odor. The oil obtained from this plant is the common oil of pennyroyal, used as a medicine.

Penobscot, the largest river in Maine, rises on the northwestern boundary of the state and flows east to Lake Chesuncook; hence it flows southeastward through Lake Pamedumcook, a beautiful body of water at the foot of Mount Katahdin, and from here flows southward to empty into the Atlantic Ocean by way of Penobscot Bay. The total length of the Penobscot is 350 miles, and its drainage basis is 8,500 square miles in extent. A great part of the drainage basin is forested, and the river furnishes easy transportation for logs at the time of the spring flood. Ocean steamers ascend as far as Bangor, about 60 miles.

Pensacola, Fla., a port of entry and the county seat of Escambia County, is on Pensacola Bay, 6 miles from the Gulf of Mexico, and 204 miles west of Tallahassee. It has a commodious landlocked harbor, the entrance to which is defended by forts McRee and Pickens. Fort San Carlos, built by the Spanish in 1696, still stands, not far from the present Fort Barrancas. Here also are the ruins of

Fort Redoubt, built by the Confederates. Seven miles from Pensacola is the United States Naval Aeronautic School, and Pensacola Bay is the winter home of the submarine fleet and of the reserve torpedo fleet. Pensacola, settled in 1696 by Spaniards from Vera Cruz, has been a possession of Spain (1696), France (1719), Spain (1723), England (1763), and Spain (1781). Because of aid rendered to England in the War of 1812 it was taken by General Jackson in 1814, who took it again in 1818 because the Spanish encouraged hostilities among the Seminole Indians.

Pensacola is chiefly a commercial city, trading in coal, naval stores, cotton, grain, lumber and fish. It is the third city of Florida, and has a fine school system and all other features that make a modern city. Population in 1920, 31,035.

Pension, pĕn′shŭn, a monthly allowance paid by the government in recognition of past services. The pension system of the United States is the most liberal known. It is modeled on that of England. The pension bureau at Washington is the largest office maintained by the government. It is in charge of a commissioner of pensions. Counting medical experts, chiefs of divisions, examiners, clerks, messengers, watchmen, and laborers, it employs 1,739 persons. Salaries, printing, stationery, and other costs of office maintenance mount up to $2,500,000 a year. The allowance to old soldiers and sailors for total disability is $8 a month for enlisted men; $13 for second lieutenants; $17 for first-lieutenants; $20 for captains; $25 for majors, surgeons, and paymasters, and $30 a month for lieutenant colonels and officers of higher rank. There is a schedule of pensions for specific disability. One hundred dollars a month is allowed for the loss of both arms; $72 for the loss of both feet, etc. The widow of a soldier or sailor whose death resulted from service, and who has not remarried, receives $12 a month. The law also directs an allowance for each minor child of a deceased soldier.

For the fiscal year ending June 30, 1920, there were 592,190 names on the roll. Classified by wars, there were: Civil War, 533,620; Spanish-American War, 30,433; Indian Wars, 6,228; Mexican War, 2,371; War of 1812, 71; women, children, mothers and others, 19,407. The amount paid for pensions during the year was $213,295,315. The appropriation for the fiscal year ending June 30, 1921, was $279,000,000. The total amount paid by the government on account of pensions up to 1921 was $5,734,370,273. The Civil War pensioners are fast falling off. In 1920 there were 243,520, and 1919, 271,391. A system of insurance instead of pensions was provided for the men in the service of the United States during the Great War. See INSURANCE.

Congress has granted special pensions to the widows of Presidents Polk, Tyler, Lincoln, Garfield, McKinley and Roosevelt.

Pentateuch, pĕn′ta-tūk, a name used to designate the first five books of the Old Testament, namely, Genesis, Exodus, Leviticus, Numbers, and Deuteronomy. They are also called the Five Books of Moses. Modern criticism is of the opinion, however, that they were not written by a single author, but are a combination of various manuscripts, in part duplicating each other. New interest has been aroused in the authorship of the Pentateuch by the discovery at Susa in 1902 of the code of Hammurabi, king of Babylon, who reigned about 2250 B. C. The code was unearthed by French explorers. It is written in cuneiform characters on tablets of clay. The resemblance between this code and the laws of Moses as embodied in the Pentateuch is remarkable. See BIBLE.

Pentecost, a festival of the Jews, occurring fifty days after the Passover from which circumstance it was named, *pentekoste,* being the Greek word for fiftieth. It is the celebration of the ingathering, that is, of the harvest. It was called also Feast of Weeks, because it occurred seven weeks, a week of weeks, after the Passover. Other names are Feast of the Harvest and Day of the First Fruits. A festival of the Christian church celebrated fifty days after Easter, in commemoration of the descent of the Holy Ghost is called Pentecost by the Roman Catholics, and Whitsunday by the Anglicans. See PASSOVER.

Penticton, British Columbia, a division point on the Kettle Valley Railroad, is situated at the southern extremity of Okanagan Lake, 251 miles east of Vancouver. The Kettle Valley Railroad maintains shops here, and the town has factories producing boxes, sash and doors, finished lumber and other articles; there are also fruit packing and canning establishments. General farming, fruit raising and lumbering are carried on in in the vicinity. Penticton has good primary schools and a high school, a library, a hospital and several hotels. Population, 1921, 4,000.

Penumbra. See SHADOW.

Peonage, the holding of a person in forced labor until his debts are paid. It is a disguised form of slavery. In a strict sense, giving a penniless outcast a choice between paying a fine and serving a workhouse sentence is condemning him to peonage. The term is applied ordinarily to service from which the master intends the person shall not escape. To confine the discussion to recent times and to this side of the Atlantic, it may be said that peonage has existed in the former slave states, and that it exists still in Mexico and in the Central American and South American states. Parts of the cotton states after the Civil War were overrun with negro vagrants who did not know what liberty meant if it did not mean to carouse in idleness. Plantations and public works were at a standstill for want of laborers. A mixture of native zeal for the public good and gratification of slaveholding instincts led to the arrest of negro vagrants for misdemeanors and selling them to contractors to work out their fines. These ignorant "convicts" signed contracts to avoid lying in prison. They were kept in gangs and were herded with shot guns to prevent escape. They were kept to their work and in subjugation with stripes. They were allowed to buy freely at the contractor's store. When the time of their contract was up they were in debt and had a choice only between the prison and a new contract. In this way the old slavedriving, not the former slaveholding, element held negroes in the gang indefinitely. Outrageous instances and descriptions of revolting camps got into the public press. As late as 1903 the courts found ninety-nine indictments against persons in Alabama and Georgia for holding negroes in peonage. Cases are not unknown of poor whites rented, practically sold, to work out fines. As a matter of fact it is difficult to draw the line between peonage and leased convict labor. For this reason a state should employ convicts on its own premises under state guards and no other.

The term peon is a Spanish word for foot-soldier. Peonage is more or less prevalent in the Latin states of both Americas. Logging, mining, railroad building, the construction of roads, and the work on coffee plantations is done in part by gangs of Indian peons, who do not know enough to escape from peonage or to stay out when they get out.

Peony, a family of showy perennials familiar in gardens. Known also as paeony and "piney." The name is from the Greek Paean, the physician of the gods, having reference to the reputed medicinal properties of the root. The peony is a member of the buttercup family. There are numerous European and Asiatic species. There is also a species native to the Pacific coast of North America. The peony may be propagated either from seeds or from root-stocks. The old-fashioned red peony has been known ever since the day of the Roman Pliny. The peony is particularly free from the attacks of insects. A clump well established and sheltered by mulch in the winter produces an abundance of flowers for many years. The florist has succeeded in producing double peonies. Two or three dozen varieties are now in cultivation. One species raised in China is a stout shrub with large rose-colored or white flowers.

People's Party, The. or **Populist Party,** a political party organized at Cincinnati in 1891. It was made up largely of farmers and workingmen, and embraced such smaller organizations as the Greenback party, the Farmers' Alliance, and the Grangers. It soon ranked next to the Republican and Democratic parties in numbers and influence. With the particular exception of free silver, many of the seemingly radical issues of its first platform are those foremost in America's politics today, such

as the income tax, the popular election of senators, initiative and referendum, etc. William Jennings Bryan was the party's presidential nominee in 1896 and again in 1900, being nominated also by the Democratic party. Thomas E. Watson of Georgia was the candidate in 1908. Though a large section of the party has merged with the Democratic party, the Populists have had more influence upon politics than results at elections would seem to indicate.

Peoria, Ill., is the second city of the state and the county seat of Peoria County. It is on the Illinois River at the point where it widens to form Peoria Lake, 50 miles north of Springfield and 150 miles southwest of Chicago. Peoria is served by steamers on the river and by the Chicago & Alton, Chicago & Northwestern, Chicago, Burlington & Quincy, Chicago, Rock Island & Pacific and other important railroads.

Buildings and Institutions. Few midwestern cities have, size considered, more attractive features than has Peoria. On a plain along the river is the industrial and commercial part of the city, while the residential section occupies higher ground farther back. There are about 500 acres of land included in the park system, and on the high ground overlooking the water is a one-hundred-foot-wide boulevard—Grand View Drive.

Peoria is the seat of Spaulding Institute and Bradley Polytechnic Institute. It has a large Carnegie library and another public library, a Federal building, the Proctor Old Folks' Home, Proctor Hospital and many handsome business blocks. The public schools are numerous and entirely modern.

Industry and Commerce. Situated in the most productive part of the Illinois corn belt, Peoria is one of the principal corn markets of the middle states. The many industrial plants are engaged in producing wire fence, paper, stoves, machine shop and foundry products, tractors, agricultural implements and machinery, glucose, wagons and other commodities. Coal and live stock are also important items of its commerce.

History. La Salle built a fort on the site of the present Peoria in 1680, but it was soon abandoned. Previously, it was occupied by a Peoria Indian village. Later, the French established a fur-trading post here, but they were driven out by Craig in 1812 for fomenting trouble between the Indians and the white settlers. In 1819 a permanent settlement was made; this attained first rank among Illinois cities before the close of the nineteenth century. In 1920 the poulation was 76,121.

Pepper, a climbing shrub native to India. The pungent berry is used as a spice. Pepper is now cultivated quite generally in tropical countries. It is propagated by cuttings and comes into full bearing in about four years. The bright red berries are about the size of peas. When the bunches of berries begin to ripen they are gathered like grapes and laid in the sun to dry. The wrinkled dried berries, winnowed free from dust and bits of stems, are the black pepper of commerce. White pepper is obtained by freeing the dried berries from an outer covering. Cayenne or red pepper is the peppery pod of another plant entirely. The cultivation of the pepper plant does not differ particularly from that of the grape vine. It will climb, if permitted, to a height of twenty feet, but it bears best if kept down to a height of ten or twelve feet. Suckers and side shoots are pruned, and the vines are pruned as in grape culture. Two crops a year are gathered. Ten pounds of green pepper produce four pounds of dry. Singapore is the chief pepper market of the world. The United States is the most liberal buyer—20,000,000 pounds a year. Pepper is used not only to season cookery, but it is employed by the packers extensively as a preservative in curing meats. See Spice.

Peppermint, a well known flavor obtained from a species of mint. This mint is cultivated for commercial purposes, in Japan, Saxony, England, New York, the southwestern corner of Michigan, and adjacent parts of northern Indiana. Reclaimed peat swamps are the best of soil for peppermint. The running root-stocks are cut into short pieces and dropped in drills like seeds. In early autumn the crop

is cut and cured like hay. Weeds must be excluded or they will spoil the flavor of the peppermint. The essence is obtained by putting the plants through a process of distillation which, in brief, consists of boiling in a closed still. The volatile oil contained in minute oil cells, chiefly in the leaves, escapes through a pipe with the steam, and is caught and cooled. An acre of peppermint should yield from ten to forty pounds of oil. The price varies from 75 cents to $4 a pound according to season. Growers consider $2 a pound a good price.

Certain lands about Niles, Michigan, were considered undesirable until some one discovered that the soil was peculiarly adapted to the growing of peppermint. Michigan leads in the production of peppermint, raising three-fifths of the entire world's product. The annual Michigan output of peppermint oil, for which the plant is cultivated, is well in excess of 100,000 pounds.

Pepsin. See GASTRIC JUICE.

Pequot, a tribe of Algonquin Indians, once native to southeastern Connecticut. Before the English settled in this territory, the Pequot and Mohegan tribes were practically one, but early in the seventeenth century a division was made, one tribe, under Uncas, keeping the name Mohegan, the other being called Pequot. At that time the Pequot numbered about 3,000. Before 1637 these Indians committed numerous outrages against the white settlers; and in 1637 a party of English, numbering about 90 and led by Captain John Mason, attacked the Pequot in their main fortification, on the Mystic River, and killed about 600 men, women and children. In this encounter the English lost only two men killed. A policy of absolute extermination was adopted, and soon only a handful of captives and a few hundred free Indians remained. The captives were sold as slaves, and the others were gathered into two villages by the Colonial government in 1655. By 1850 they had dwindled to a group of 40, and are now extinct.

Pepys, pĕps, **Samuel** (1633-1703), an English gentleman. He was the son of a London tailor. He was educated at Cambridge, and, having the faculty of making himself useful and agreeable, he soon obtained the patronage of those in power and was for many years in one branch or another of the public service. A peculiar light is thrown on the education of that day by a note to the effect that, on entering upon a secretaryship in the navy department, he found it necessary to learn the multiplication table of which he had never heard before. Interest in Pepys arises from a diary which he began January 1, 1660, and discontinued May 31, 1669, on account of defective eyesight. It was written from day to day in a peculiar shorthand that preserved it from the eye of the curious.

Perch, a genus of fish belonging to the same family as the "wall-eyed pike." The American perch is from six to twelve inches long with well developed fins, a large mouth, and yellow sides with six to eight dark bands across the back. Perch are found in all clear inland water, and, aside from size, are a fine table fish. They bite freely and are depended upon to fill up a string when larger fish fail.

Percy, Thomas (1729-1811), an English poet and bishop. He was born at Bridgenorth, and was educated at Oxford. He became Bishop of Dromore, Ireland, in 1782. His most important literary work was the edition of *Reliques of Ancient English Poetry,* published in 1765. This is a collection of old ballads, many of which had existed up to this time only in manuscript and others printed on loose sheets. The work of Bishop Percy was done carefully and systematically. Some of the ballads and fragments he retouched or filled out, but always with taste and judgment. He discovered that the oldest among these ballads were traceable readily to the region of border warfare between England and Scotland. The influence of Bishop Percy's collection can hardly be overestimated, awakening as it did an enthusiasm for the natural and vigorous in literature as opposed to the artificial. It gave direction also to the genius of several illustrious writers, among them, Sir Walter Scott, who is believed to have obtained from these ballads the inspiration and sentiment that led to his great poems and novels.

Père Lachaise, pār lä-shāz′, a celebrated burial ground of Paris. It was named after Lachaise, the Jesuit confessor of Louis XIV, whose summer seat occupied the site of the present chapel. The grounds were laid out as a cemetery in 1804. It lies on a hill at the northeastern end of town. It covers an area of 110 acres. While Père Lachaise is only one of twenty-three city burial grounds and is designed primarily for the burial of the people who die in that quarter of the city, it is the cemetery in which persons of distinction are buried usually. Ordinary families acquire a space of ground three feet wide by seven long. A pit is dug perhaps thirty feet in depth. An iron post is placed at each corner, with crosspieces to sustain the coffins. The first coffin is placed at the bottom of the pit, the second next above it, and so on, until the grave is full. In this way, perhaps a dozen or more interments may be made in the same grave.

The cemetery is open to visitors from six in the morning until seven at night. There are over 20,000 marble and granite monuments. Well shaded walks and avenues intersect in every direction. Among the monuments visited are the Gothic canopy of Abelard and Heloise; the chapel of the De Lesseps family; the monuments of Chopin and Pleyel, pianists; the graves of Thiers, Sieyes, and Marshal Ney; Gay-Lussac, the chemist; Lafontaine, the writer of fables; Molière, the dramatist; Laplace, the mathematician; David, the painter; and Arago, the astronomer. All interments are in charge of a company licensed for the purpose. According to custom visitors stand with uncovered heads whenever a funeral procession goes by. The immediate vicinity of the principal cemetery gates is occupied by marbleworkers and sellers of flowers.

Perennial. See HERB.

Perfumery, an article of toilet. Some one has said that the most delicate perfume of all is just no perfume at all. Certainly a truth is hidden in the statement. Some toilet perfumes are animal secretions, as musk and civet, ambergris and castor; some are chemical compounds, more or less successfully imitating natural perfumes; some are natural gum-resins, as myrrh and camphor; but the most suitable perfumes are those derived from plants, such as might be supposed to emanate from a bouquet of fragrant flowers. The fragrance of plants is due to an oil contained in tiny oil cells or sacs in various parts of the plant. This fragrant oil is present in the flower of the rose, violet, jasmine, tuberose, water lily, apple, and plum. In the thyme, geranium, and wintergreen it is found in the leaves. Red cedar and sandalwood have fragrant wood; orris and sweet flag have fragrant roots. In all these cases fragrance is due to the presence of an essential oil; that is, an oil that evaporates slowly. Minute particles of oil falling on the nerves of smell create a pleasing sensation. Some perfumes kill bacteria.

These essential oils are obtained for commercial purposes by distillation—a process of boiling during which the oil evaporates rapidly and is caught and cooled with the steam. The oil and water are then separated by redistilling, but some trace of oil will remain in the water, making rose-water, lavender water, etc. Southern France is noted for fine perfumes. Around Grasse there are vast flower gardens. The inhabitants devote their energy to raising fields of violets, jonquils, mignonettes, roses, carnations, lavender, orange-blossoms, acacias, jasmines, and tuberoses. The harvest begins in March. They sell the fragrant blossoms by weight. The business of distilling, bottling, and labeling perfumes and water has become an immense local industry. Three hundred thousand pounds of violet blossoms alone are used annually. Ten billion pounds of all sorts of blossoms are used in making perfumery and essences.

Some flowers do not yield their perfume freely by distillation. In such cases two other methods are employed. Flowers are spread on hot melted oil or fat until the perfume is absorbed, and by repeating this process several times the grease becomes a highly fragrant ointment or unguent. This method is called maceration. Another way is known as enfleurage or enflowering. A paste of purified suet and lard is spread on the glass bottom of an air-tight box. Blossoms are laid on the grease and the lid is closed tightly. The old flowers are removed and fresh flowers are provided each

morning until the grease is fragrant. Next to the French, the Turks are skilled in the various methods of producing attars, pomatums, and fragrant waters.

A hundred years ago scientists had no idea that perfumes could be made in any laboratory but that of nature. It was not supposed that the odor of a violet could ever be obtained except from the violet, but of late the chemist has succeeded in performing wonders. He not only manufactures indigo from coal tar, but, by combining chemicals, he is now able to produce many perfumes and may in time be able to produce any floral perfume known. Such putting together of chemicals is called synthesis. The process is not simple, but the skillful chemist is now able to put together chemicals with offensive odors and produce the perfume of heliotrope, hyacinth, pink, rose, violet, hawthorn, lilac, musk, wintergreen, vanilla, cinnamon, bitter almonds, and that of many fruits.

The fragrance of the article produced by synthesis cannot be told from the fragrance of the perfume of floral origin. It is predicted freely that the fields now beautiful in season with flowers raised for their fragrance will be surrendered to more prosaic crops, and that the delicate perfumes of the toilet will be produced from ill-smelling chemicals in unattractive laboratories.

See ATTAR OF ROSES; MIGNONETTE; HELIOTROPE; CARNATION; VIOLET; OIL.

Pergamus, an ancient city of Asia Minor. It grew up about an acropolis near a small stream about fifteen miles inland from the Mediterranean. It was founded by settlers from Greece. On the dismemberment of Alexander's empire Pergamus became the seat of an independent kingdom. The wealth of a large part of Asia Minor centered here for a century or two, and Pergamus became one of the most magnificent cities of the age. Sculptors were attracted by the prospect of rich reward.

Under Eumenes II, who ruled 197-159 B. C., a vast marble altar in honor of Zeus Soter was built in the Agora. It was adorned with statues and especially by an enormous frieze depicting the defeat of the barbarian giants by the gods. This altar was one of the marvels of the ancient world. The sculptors of Pergamus lacked the refinement of Phidias, but their work stirs the student by its vigor. In the nineteenth century Turkey gave the Germans permission to excavate among the ruins of the city. In 1878-80 search was made. Slab after slab of the colossal frieze was found practically uninjured. The sections were sent down the hill in a slide, rafted down the stream to its mouth, and conveyed on board a steamer. They were taken in triumph to Berlin, where they are now displayed in the gallery of antiquities of the Old Museum, an exhibit second only to that of the Elgin Marbles. About two-thirds of the large outside frieze was recovered. An excellent cut of a portion of the famous frieze may be found in the *Century Dictionary* under the article on Pergame. Portions of a smaller frieze from the interior were also recovered, constituting a series of portrayals in marble of the doings of Pergamus, a local hero for whom the city was named. A large amount of other material hardly less interesting was obtained from the ruins of various temples and public places.

As a literary center Pergamus ranked second only to Alexandria. Every effort was made to accumulate manuscripts until an enormous library, now lost, had been built up. The city was famous for the manufacture of parchment, that is to say, the preparation of goatskins for the use of the scribe. The very name parchment is a corruption of the Greek Pergamena, meaning skin of Pergamus. The city passed under Roman rule 133 B. C. A Christian church was established here at an early date. "The church of Pergamos," is one of the seven stars, the seven golden candlesticks to which Saint John refers in the Revelation. A modern Turkish town of 20,000 people lies at the foot of the old acropolis.

See PARCHMENT.

Pericles, pĕr′ĭ-klēz (493?-429 B. C.), the leading statesman of Athens. He was born at Athens. He was liberally educated, his chief instructor being no less than the philosopher Anaxagoras. Though of wealthy family he appeared in public life as the leader of the people. His opponent was Cimon, the leader of the aristocratic party. The latter was ostracized, leaving Pericles full sway. Athens was at

this time a democracy governed by a general assembly by whom a body of generals was appointed. Pericles was elected leader of the generals fifteen consecutive times and was for a period of thirty years the real ruler of Athens. He was careful not to assume arbitrary authority. All his measures were proposed first in the popular assembly. He was an orator of consummate art, and succeeded in keeping the people on his side. All acts of government were performed through and by order of the popular assembly in the eye of the people, whose idol he was. Pericles was merely an executive officer, carrying the popular will into effect.

The ancient council of the Areopagus was set aside. He adopted a vigorous foreign policy. He extended the commerce of Athens, making surrounding states and cities tributary. From the mines of Thrace, the tribute exacted from allied cities, and from customs, he raised a revenue of $1,000,000 a year. A large part of this sum was spent in building and maintaining a navy. A part was spent in building the Long Walls connecting the port of Piraeus with the city, and vast sums were spent in beautifying and adorning Athens. He induced the Athenians to spend a greater part of the revenue in beautifying the city than has been known in a republic before or since. The Parthenon and the other architectural ornaments of the Acropolis were erected in his day. The masterpieces of Phidias, the greatest of sculptors, belong to this period. Speaking of this period, historian Abbott says:

> No description can give anything but a very inadequate idea of the splendor, the strength, the beauty, which met the eye of the Athenian, whether he walked around the fortifications, or through the broad streets of the Piraeus, or along the Long Walls, or in the shades of the Academy, or amidst the tombs of the Ceramicus; whether he chaffered in the market place, or attended assemblies in the Pnyx, or loitered in one of the numerous porticoes, or watched the exercises in the Gymnasia, or listened to music in the Odeum or plays in the theaters, or joined the throng of worshippers ascending to the great gateway of the Acropolis. And this magnificence was not the result of centuries of toil; it was the work of fifty years.

The age of Pericles was also the period of the greatest development in Grecian literature. The three Greek tragedians, Aeschylus, Euripides, and Sophocles, together with Aristophanes, the writer of comedy, belong here. The theater of Dionysius, the greatest in the world, was constructed during this period. It was capable of seating the entire body of Athenian voters. The masterpieces of the great tragedians were acted here at state expense. Free tickets of admission were issued to all citizens. This policy of Pericles has been assailed vigorously as tending to foster a spirit of pauperism. It has been compared to the distribution of free wheat by the rulers of Rome. The historians of this period are Herodotus, Thucydides, and Xenophon. The great philosophers belong to a later period.

Ere Pericles laid down the reins of office Athens had been unfortunate in wars with her neighbors and had lost most of her possessions. The Peloponnesian War, coming soon after his death, reduced Athens to a secondary position in point of political influence. The city of Pericles continued, however, to be the intellectual and artistic center of Greece for many generations.

The private life of Pericles appears to have been commendable from the Greek point of view. He was, of course, the object of many a jibe and was more than once accused of serious public offenses. It does not appear, however, that he was ever guilty, let alone convicted, of dishonesty or mismanagement of public affairs.

From the point of view of modern times his domestic life was not what it ought to be. He divorced his wife for the purpose of living with Aspasia, a brilliant woman whom the laws of Greece did not permit him to marry legally. She was considered the most intellectual and attractive woman of the day. Pericles was a patron of arts, a lover of beauty. Such talk on art, literature, and politics, as may very naturally have passed between two such gifted minds as those of Pericles and Aspasia, form a delightful feature of Walter Savage Landor's *Imaginary Conversations.*

Our knowledge of Pericles is derived chiefly from Plutarch's *Lives.* Plutarch, in turn, drew from the writings of Thucydides and other contemporaries of the great statesman. None of Pericles' orations have been

preserved. One alleged saying from a funeral oration delivered over Athenians who had died in war, "The world is the burial place of great men," is worthy certainly of preservation. As he lay on his deathbed his friends were consoling themselves with remarks relative to the great accomplishments of his lifetime. He is said to have aroused himself sufficiently to call their attention to the fact that, although he had been in supreme power for three decades, "No Athenian ever put on mourning through act of mine."

See ATHENS.

Periodical, a publication appearing at regular intervals. It is to be distinguished from a newspaper, a book, report, or bulletin. So far as known the credit for originating the periodical form of literature is due to France. The first number of the *Journal des Savants,* the first magazine known, appeared at Paris, January, 1665. The *Revue des Deux Mondes* (the Review of Two Worlds) and *Figaro* are now the best known of French periodicals.

The earliest British periodical, *Weekly Memorials for the Ingenious*, began publication January, 1681. Among the older British periodicals are *The Edinburgh Review,* founded in 1802; the *Quarterly Review,* in 1809; *Westminster Review,* 1824; *Athenaeum,* 1828; *Fortnightly Review,* 1865; *Contemporary Review,* 1866; *Academy,* 1869; *Nineteenth Century,* 1877; and *Review of Reviews,* 1890. All these are serious publications devoted to scholarly discussion of art, literature, music, politics, and the like. The forerunners of lighter magazines were the *Tatler*, published from 1709 to 1710; *Spectator*, 1711-12 and 1714; *Guardian* and *Rambler,* 1750-51. *Chambers's Journal* and the *Penny Magazine* were founded in 1832; *Cassell's Magazine,* in 1853; *Macmillan's,* in 1859; *Cornhill,* in 1860; *Longman's,* in 1883; *Strand,* in 1891; *Pearson's,* in 1896.

The history of American periodicals begins with the *General Magazine and Historical Chronicle,* a few numbers of which were issued at Philadelphia by Benjamin Franklin in 1741. The *North American Review* was founded in 1815. A few people living can remember when *The Dial, Putnam's, The Galaxy*, and *Littell's Living Age* were founded. *Harper's Monthly* was established in 1850; the *Weekly* in 1857; the *Bazaar* in 1867. From this date new magazines crowded in rapidly. The *Atlantic Monthly* appeared in 1857; *Overland* and *Lippincott's* in 1868; the *Century,* 1881; *Forum,* 1886; *Scribner's* and *Cosmopolitan* in 1887; *Arena,* 1889. Other periodicals that crowd the news stands are *Munsey's, Everybody's, McClure's, Metropolitan, Collier's, Woman's Home Companion, Ladies' Home Journal, World's Work, Review of Reviews, Outlook,* and a host of more or less trifling publications, as *The Black Cat, The Philistine,* etc. The *Youth's Companion* and *St. Nicholas* are no doubt the leading juvenile periodicals. A number of publications appeal to readers, as the *Bookman,* the *Booklover*, the *Critic.* Each trade and profession calls out its special journals, as *Educational Review, American Catholic Quarterly Review, Political Science Quarterly, Iron,* and *Bradstreet's.* The *Scientific American* is a popular publication. The volume of periodicals is so great that Poole's *Index* and Wilson's *Guide,* themselves of magazine size, are devoted solely to indexing the periodical literature of the month. Stead's *Index* finds similar support in England.

The manufacture of a popular magazine is a huge undertaking aside from the expense of securing and editing the contents. A printing plant of magnitude must be established. A monthly like *McClure's* requires sixteen carloads of white paper for a single issue. Advertisements are relied upon to defray the greater part of the expense of publication. A color page in the *Saturday Evening Post* is quoted at $9,000 per issue. Each publisher has an agreement with the news agents as to the day of the month when his magazine is to be placed on sale. Then the issue is made ready and is shipped to remote localities first. All general dealers are required to hold their supply until the hour agreed upon for distribution. The monthly sales of a popular magazine reach a high figure.

In 1921, the periodicals having a circulation of 1,000,000 copies and over were *The Saturday Evening Post,* over 2,000,000; *Woman's World; Ladies' Home Journal; Butterick's Quarterly; Pictorial*

Review; *Collier's*; *Cosmopolitan*; *American Magazine*; *Woman's Home Companion*; *McCall's* and *Needlecraft*. The circulation of others exceeds 500,000.

Perjury, a false statement made wilfully and under oath. Perjury is committed in a judicial proceeding where one falsifies any matter relevant to the case in point, at the time when he is lawfully required to speak the truth. In some states the offense is accounted a misdemeanor; in others, a felony. A person cannot be convicted of perjury on the testimony of one witness alone. Further corroborating evidence must be procured, for no one can be declared guilty until proved to be so beyond reasonable doubt. The penalty for the crime varies in the different states. The

Permian Period, the name given by geologists to the last of the smaller time divisions of the Paleozoic Era. The Permian is known in Germany as the Dyas Period. In Europe the Permian rocks overlie the Carbonic deposits, but in North America no clear distinction can be drawn between them; the latter fact has resulted in a controversy over the proper place of the Permian Period in the later Paleozoic group.

In Ohio Pennsylvania and West Virginia the Permian deposits are very distinct; in these states they are known as the Dunkard Creek series or Upper Barren Measures. Here the deposits consist of non-marine beds of sandstones, and calcareous formations. See GEOLOGY.

Permutations, in mathematics, the number of groups that can be formed with a given number of units, taking order into consideration. With *a* and *b* but one combination, *ab,* can be formed, but two permutations, *ab* and *ba,* are possible. Both of these permutations are the same combination.

Pernambuco, pĕr-näm-boo′kō, the capital and chief seaport of a state by that name in eastern Brazil. The city is called also Recife. It is built in three sections, one on a peninsula, another on an island, and the third and newest on the mainland, all connected by bridges. The peninsular section contains the business part, the island portion the government buildings and theaters, and the mainland most of the residences, including many handsome homes with beautiful gardens. Pernambuco is the seat of numerous charitable institutions, and of a famous law school. Numerous steamship lines visit it, for it is a market for quantities of sugar, cotton, skins, tobacco, etc. Its population is about 217,000.

Perpetual Motion. In its common acceptance as a device which will go on producing useful work without any outside source of energy, the perpetual motion machine has taken its place with other famous fallacies of the past, such as the squaring of the circle and the elixir of life. Though most of the great physicists have recognized its impossibility, and the French Academy as early as 1775 refused to receive any treatises on the subject, it was not till 1847 when the doctrine of the conservation of energy was so clearly enunciated by Helmholz, that it may be said to have been finally overthrown.

Most of the investigators in this fascinating field endeavor to utilize some force in nature in a part of their contrivances from whose influence the remainder is in some way screened. Gravity has lent itself most often for this purpose, chiefly in a wheel with the descending side kept constantly heavier in some way or other; or in the water-wheel which in some way raises the water to the reservoir again, either by means of an Archimedes screw, the hydrostatic paradox, or by capillary action. In some more recent attempts electricity and magnetism have been tried out with equal lack of success. In the main those undertaking the solution of this venerable problem have but a smattering of scientific knowledge and well illustrate the adage "a little learning is a dangerous thing."

Perrault, pā-rō, **Charles** (1628-1703), a French poet and story writer. Perrault was a man of wide learning. His name was brought into prominence by a famous literary controversy between himself and Boileau, as to the respective merits of the ancients and moderns. Perrault's poetry was not of a high order and won him no lasting fame. He is better known as the author of two prose works, *Illustrious Men*

of the Seventeenth Century and a collection of stories entitled *Tales of Mother Goose.*

Perry, Bliss (1860-), an American editor, author and university professor, was born at Williamstown, Mass. In 1881 he graduated from Williams College, and subsequently studied at Berlin and Strassburg, Germany. From 1886 to 1893 Dr. Perry was professor of English at Williams College, and at Princeton University from 1893 to 1900. He edited the *Atlantic Monthly* from 1899 to 1909, and during 1909-10 represented Harvard University as special lecturer at the University of Paris. In 1907 Dr. Perry accepted the professorship of *belles-lettres* at Harvard University. Among his publications are: *The Broughton House, The Plated City, The Powers at Play, A Study of Prose Fiction, Walt Whitman, The American Mind, The American Spirit in Literature, Thomas Carlyle* and *A Study of Poetry.*

Perry, Matthew (1794-1858), a brother of Capt. Oliver Hazard Perry. He rose to be a commodore in the American navy. He commanded an expedition to Japan, 1853-54, during which he concluded a treaty opening Japan to American commerce. The immediate purpose of the expedition was the protection of the American whalers who frequented the Japanese coast.

Perry, Nora (1832-1896), an American poet and story writer. She was a native of Massachusetts and was engaged for many years in journalistic work. She is best known for her stories for girls, her ballads, and other short poems. Among her stories may be mentioned *Hope Benham, The Youngest Miss Lorton,* and *A Flock of Girls.*

Perry, Oliver Hazard (1785-1819), an American sailor. He was born at South Kingston, Rhode Island, and died at Port Spain, Trinidad. He was trained as a midshipman in the United States navy, and served in the Tripolitan War. In the War of 1812 he defeated the British in the celebrated battle of Lake Erie, September 10, 1813. He announced his victory to General Harrison in the oft quoted words, "We have met the enemy and they are ours." This victory enabled Harrison to invade Canada. Perry pursued Proctor's squadron up the Thames and won a second victory October 5, 1813, at Put-in-Bay, near Detroit. These victories were of great service in recovering possession of Michigan.

Persephone, or **Prosperine.** See DEMETER.

Persepolis, per-sĕp′o-lĭs, an ancient capital of Persia. It was the royal residence of Darius and Xerxes. The city was captured and partly destroyed by Alexander the Great. The vast remains may still be seen far to the southeast of the Euphrates Valley in a vale about 200 miles from the Persian Gulf. The number of palaces and treasure houses must have been very great. So many pillars are still standing that the Arabs have given the locality the name of the "Thousand Pillars." The more notable edifices appear to have been constructed of huge blocks of stone, fitted closely together without mortar, but fastened in many instances, at least, with clamps of iron. These the Arabs long since pried away for spearheads. The principal buildings were placed on artificial, terraced mounds. One of these is ascended by 106 steps wide enough for ten men to walk abreast, and of so easy a gr de that it is quite possible for horsemen to ride up. The entrance to one of these terraces, attributed to Xerxes, is approached through a huge gate guarded by four winged bulls resembling similar sculptures found at Nineveh. A room known to explorers as Xerxes' throne room contains thirteen columns, each sixty-four feet in height. Other remains, scarcely inferior, have been surveyed in the most cursory manner. The entire region awaits the antiquarian. No doubt inscriptions to be one day unearthed may add much to our knowledge of Persian history and civilization.

Perseus, in Greek legend, a famous hero, son of Danaë and Zeus. An account of his birth in the tower of brass and of his journey over the waves shut up with his mother in a chest is given in the article on DANAË. Perseus grew up at the court of Polydectes, king of Seriphus. Polydectes wished to marry Danaë and, in order to accomplish his purpose, thought best to get rid of Perseus. He therefore sent him to

conquer Medusa, whose locks were writhing snakes and who was so horrid to look upon that one glance would turn one to stone. But Perseus was a favorite with the gods. Hades loaned him his helmet, which made the wearer invisible at will. Hermes offered his winged sandals, and Athene her shield. Perseus did not know where Medusa was, but by his magical equipment and resourcefulness he found her in a cave by the sea. While she was asleep, his eyes turned away, but guided by her reflection in his shield, he cut off the horrid head. Later Perseus returned to Argus, his birthplace, where he became king, having accidentally killed his grandfather, Acrisius, thus fulfilling the prophecy. See DANAE; MEDUSA; ATHENE; ATLAS; CASSIOPEIA.

Pershing, John Joseph, commander-in-chief of the American Expeditionary Forces in France during the Great War. He was born near Meadville, Missouri. His mother was a native of Tennessee. His father, a Northerner, is described as a man of deep religious convictions. Young Pershing was remarkable for two things—his pronounced earnestness and intense application to the task before him. As a boy, he was reliable rather than brilliant. To obtain a superior education was a passion with him. He taught school and saved every penny he could obtain, building up a little fund for that purpose. His idea was to become a lawyer, but he saw in a local newspaper at Kirksville, Missouri, where he was attending a normal school, the announcement of an examination for entrance to West Point. He won by a single point and was graduated from the academy in 1886. He was not at first considered a remarkable student, but his determination to win stood him instead of brilliance. In his senior year he was first in rank of all the cadet captains in his class. The year he left West Point, he was commissioned a second-lieutenant in the United States cavalry and soon afterwards served in the western Indian campaign in command of the Sioux Scouts. Later he served in Cuba, was chief of the Bureau of Insular Affairs, conducted military operations against the Moros in the Philippines and was military attache' in Japan, during the Russo-Japanese War. Returning to the Philippines as governor of the Moro province, he succeeded in restoring it to order. Then he came to America and commanded the eighth Brigade at Presidio, California, whence he was called to the Mexican border to fight Villa. While in Mexico, a great sorrow came to him in the loss of his wife and three young daughters by the burning of the Presidio. His infant son was saved by a nurse. In 1917 he was commissioned as fifth full general of the United States, succeeding Washington, Grant, Sherman, and Sheridan.

Persia, pĕ′shĭ-a, a kingdom of modern Asia. It lies between the Caspian Sea and the Persian Gulf. The area is 628,000 square miles. A large part of it is absolute desert. The population is about 8,000,000. The capital, Teheran, is about 100 miles south of the Caspian Sea; population estimated at 200,000. Other cities are Tabriz, with 200,000, and Ispahan, with 80,000. Nearly 6,500,000 are Mohammedans. There are in addition about 10,000 Parsees, descendants of the ancient Persian fire worshippers, 40,000 Jews, 50,000 Armenians and 30,000 Nestorians.

GOVERNMENT. Persia's form of government was up to 1906 similar to that of Turkey. The Shah was an absolute ruler within the limitations of the Mohammedan religion. But the Persian people demanded representative institutions, and in 1906 a National Assembly, or "Majlis," was established, which sat from October, 1906, to June, 1908, and drew up a constitution which was approved by the Shah on December 30th, 1906. This Assembly held sessions in 1909 and 1915. The present Shah is Sultan Ahmed, crowned July 21, 1914, but the government is under the control of a cabinet, which was formed in 1922. In 1919 an agreement was reached between the governments of Persia and Great Britain, which provided for a British adviser in the administration of affairs, British financial assistance in administrative reforms, and a joint British and Persian military commission, which was to discuss and perfect plans for the military defense of the country. However, this agreement did not go into effect, since it was rejected by the Persian Prime Minister in 1921. The cabinet formed in 1922 issued a statement

to the foreign powers that Persia would be entirely independent in the management of the affairs of the government, that foreign troops would not be permitted in the country, but that at the same time Persia and its government desired to be on a friendly footing with all nations. In 1920 a financial adviser was chosen from the United States, Dr. A. C. Millspaugh, economic adviser of the Department of State at Washington, D.C., being appointed Administrator-General of the finance of Persia.

MINERALS. There are mines of lead and copper in nearly all provinces. Many of these mines have been worked from the greatest antiquity. Tin, antimony, nickel, cobalt, zinc, manganese, borax, and ochre are found. There is coal of good quality near Teheran. Enormous deposits of iron ore are as yet unworked. There are also valuable salt pits and deposits of sulphur and alum. Northern Persia is expected some day to develop as a valuable oil-producing region. The chief precious stone is the turquoise. A naptha-bearing zone extends along part of the western frontier.

TRANSPORTATION, ETC. The country is traversed by numerous caravan routes. There are but a few hundred miles of wagon roads in the kingdom. The chief of these leads from Teheran, the capital, to the Caspian Sea. There are but one hundred and fifty miles of railroad in the whole kingdom. There are several thousand miles of telegraphs, however, under English and Russian management. A regular postal service between the principal cities was established in 1877. Foreign service with the capital is maintained by way of Russia. In the lack of roads, commerce is carried on largely by caravans.

ANIMALS. The camel of the country is a stouter, rougher animal than the camel of Arabia. It is not only able to endure a great degree of cold, but it carries a burden nearly twice as heavy. Horses, oxen, and mules are used also for domestic purposes. The lion is still found in Persia, as well as the tiger, the leopard, wild ass, wolf, mountain sheep, wild goat, and deer.

HISTORICAL. The history of Persia is a long story. Persia and Media were fused into one country about 546. A few years later the Persians subdued the civilization of the Tigris-Euphrates Valley. Under Cyrus, Darius, and Xerxes, in short, until conquered by Alexander the Great, the Persians were the dominant military power in western Asia.

The history of Persia from the conquest by Macedonia to the present time is a tangled web of dynasties and revolutions. There were incessant invasions of Roman territory by the Persians and of Persian territory by the Romans. Saracen and Mongol, Haroun-al-Raschid and Tamerlane, have borne sway at various times.

The present civilization is essentially Turkish. Babylonian influences are very evident in the early architecture. Medieval Persia was noted for its pottery and for handwork in the various metals. Persian swords had a reputation scarce inferior to those of Damascus. Persian smiths produced beautiful steel armor inlaid with precious metals.

STATISTICS. The following statistics are the latest from trustworthy sources:

Area, square miles	628,000
Population	8,000,000
Nomads	3,000,000
Chief Cities:	
Teheran	200,000
Tabriz	200,000
Ispahan	80,000
Meshed	70,000
Kerman	70,000
Shiraz	50,000
Number of provinces	33
Members of senate	60
Members of national council	156
National revenue	$5,000,000
Bonded indebtedness	$10,000,000
Imports	$85,051,200
Exports	$47,655,100
Rugs exported, value	$1,557,587
Petroleum, barrels (42 gals.)	14,600,000
Miles of railway	150
Number of schools	50
Pupils enrolled	4,000

See TEHERAN; PARSEES; PERSEPOLIS; ARARAT; CARAVAN; CAMEL.

Persian Literature. See LITERATURE.

Persimmon, a small tree of the ebony-wood family. The persimmon grows in woods and old fields from Rhode Island to Iowa and south to the Gulf. The fruit has the appearance of a plum, but without relationship to it. It is strongly astringent, *i. e.,* puckering, berry when green, but it becomes sweet and eatable after frosts.

Personal Property, as distinguished from real, refers to movable and temporary things, as distinct from immovable property, such as land and things physically attached to it. One may have a right to personal property through ownership or possession; or, the right may be in action—for example, the right to sue. Real property, at the death of the owner is inheritable; personal property is placed at the disposal of the administrator. The rights of the property holder are protected by constitutional provision. He has the privilege of disposing of his property in any way that he deems wise, provided he in no way infringes on the rights of others. On the other hand, if public welfare demands dispossession of property, this can be accomplished under the provision of due compensation. Both real and personal property may be owned individually or conjointly. The rights of authors and inventors to the profits accruing from their inventions or productions are exclusively protected by patent and copyright. Personal property can be transferred by agreement. Property is lost by confiscation, capture, legal disposition, or through natural causes. See REAL ESTATE.

Perspective, representation of objects on a flat surface according to geometrical rules, in the way they appear to the eye from a given point of view. Objects are so delineated that they grow smaller the more remote their position from the eye. The element of perspective is essential in painting and drawing to produce naturalness and avoid contortion and flatness, because of the fact that objects are always represented on opaque planes. The point of view is the point at which the eye that views the object is placed. Vanishing points are those points to which lines parallel to each other in the object, converge in the picture. The horizontal line is alway on the level with the eye of the observer. The plane of projection is a supposed transparent plane intersecting all the points of the surface of the body and forming the perspective projection of all these points.

Perspiration, in physiology, a liquid given off by the glands of the skin. A more common but less elegant term is sweat. The sweat glands are slender tubes of considerable length. The lower portion is coiled in a sac amid the innermost cells of the skin. This follows a wavy path through the cutis or true skin, and reaches the surface in spirals—twisted like a thread. The knotted coil within the sac absorbs moisture and wastes from the blood in the capillaries by which it is surrounded. The fluid thus gathered is discharged at the outer surface of the skin. The liquid consists chiefly of water, but it contains phosphorus, sulphur, and salt also, together with traces of waste matter that impart disagreeable odors.

A person perspires at all times. If a piece of glass be held against the body it will reveal a trace of moisture. In case of heat or severe exertion the amount of perspiration is sufficient to become visible. Authorities claim that a normal person under ordinary conditions gives off from two to three quarts of invisible perspiration daily. This point is determined chiefly by noting loss of weight. An athlete may lose several pounds in a very short time, as during a boat race.

Perspiration performs its greatest service in cooling the body. It is a well known principle of physics that evaporation makes way with a large amount of heat. Under ordinary conditions the flow of perspiration and the consequent rate of evaporation are regulated by nature so as to maintain a uniform temperature of about 98° Fahrenheit.

Perth Amboy, N. J., an industrial city and a port of entry, is 15 miles south by west of Newark, on Raritan Bay at the mouth of Raritan River, and on the Lehigh Valley, the Pennsylvania, and other railroads. It has a fine harbor, and its trade is extensive. Here are located the terminal coal docks of the Lehigh Valley Railroad, large ship yards, copper smelters and refineries, and manufactories of chemicals, cork, wire and cable, asphalt paving and roofing material, steel and lumber. Near the city are valuable deposits of fire clay, making Perth Amboy a center of the brick and terra cotta industry.

The city has a fine school system and a Carnegie library. It was the capital of New Jersey province from 1684 almost continuously to the time of the Revolution. The population was 41,707 in 1920.

Peru, a republic of South America. It lies on the Pacific coast, approaching within three degrees of the equator. It borders with Ecuador, Colombia, Brazil, Bolivia, and Chile. A large triangular tract of territory on the east was long in dispute between Brazil, Bolivia and Peru, but was finally allocated to the latter. This increased the area, which is now 722,461 square miles. The Cordilleras, corresponding to the coast range of North America, follow the coast about twenty miles from the ocean. The main range of the Andes lies farther inland. The country is thus divided into three physical regions, the central, or Sierra region, including the two ranges of mountains mentioned, together with their intervening tableland, the district on the east of the Andes, and a narrow region lying along the coast.

Characteristics. The mountains rise to a great height. The more prominent peaks attain an altitude of from 16,000 to 22,000 feet. The strip along the coast is rainless and arid. It has few good harbors. The headlands are for the most part abrupt and lofty. These and the islets along the coast are frequented by myriads of seabirds, terns, and gulls. They hover along the coast in white flocks resembling clouds. They live on fish snatched from the sea. They nest on barren islets. Their guano, formerly found in deposits of from ten to fifty feet in thickness, has been a source of national revenue, but it is now almost exhausted.

The heart of the Sierra region is a valley about 380 miles in length. It was the seat of the civilization of the Incas, the scene of Pizarro's cruel exploits. This valley has a general altitude of about 12,000 feet. It is hemmed in by ranges of lofty mountains. The line of perpetual snow lies about 16,000 feet above the sea. The region east of the Andes is clothed with tropical forests, including millions of rubber trees.

Products. Although lying between the equator and the tropic of Capricorn, Peru has every variety of climate. The lower regions produce cotton. Corn grows abundantly in valleys of moderate altitude. The tableland of the Sierras is the original home of the potato. Peru is still a land of precious metals, as Pizarro found it. The annual production of gold is not far from $2,000,000. Silver and copper are produced also. Other minerals are cinnabar, zinc, lead, borax, sulphur, arsenic, and antimony. There are extensive coal fields and veins of iron ore. The Pacific coast is rich in petroleum.

Agriculture. The chief agricultural productions are cotton, coffee, and sugar. Irrigation canals have been constructed which may, in time, it is hoped, convert a considerable portion of the arid coast into sugar lands. Cocoa, rice, tobacco, grapes, wheat, oranges, Indian corn, ramie, silk, quinine, and dyes are produced in considerable quantities. Rubber produced in the eastern region is shipped down the Amazon. There are large exports of wool and alpaca.

Government, Religion, Etc. The republic of Peru declared its independence from Spain in 1821, but did not gain its actual freedom until 1824. The government, like that of the other South American republics, resembles that of the United States. There is a congress of two houses. The president is elected by direct vote for a term of four years. In the absence of a recent census the population is estimated at 4,600,000. About sixty per cent of the inhabitants are Indians still speaking their native language. The Roman Catholic faith is the religion of the state. The constitution of Peru forbids the public exercise of any other religion, but, as a matter of fact, Protestant churches are tolerated in the larger cities. A system of public schools has been established in the towns. In 1920 there were about 194,700 pupils enrolled. The children of white people are pretty well provided for. The Indians are still in ignorance. Government high schools are maintained in each province. A central university at Lima, the capital, is the most ancient school of any sort in the New World. Its charter, granted by Charles II, bears the date of 1551.

The revenues of the government are derived chiefly from customs levied on imported cottons, woolens, furniture, provisions, wines, drugs, and machinery. Internal revenues are collected on alcohol, opium, and tobacco. Oil is a government monopoly. There are over 1,900 miles of railway and

about 8,900 miles of telegraphic lines. The loftiest railroad on earth is the Oroya Railroad of Peru. The locomotive climbs to an altitude 1,400 feet higher than Pike's Peak. Gold is the basis of coinage. The national coin is the libra, corresponding in value to the English pound.

STATISTICS. The following are the latest reliable statistics available:

Area, square miles	722,461
Population (estimated)	4,600,000
Chief Cities:	
Lima	176,467
Callao	52,843
Arequipa	35,000
Number of departments	22
Members of senate	57
Members of house of representatives	128
National revenue	$40,000,000
Bonded indebtedness	$35,000,000
Cotton bales (500 lbs.)	134,352
Sugar cane, pounds	287,480
Rice, pounds	12,758,000
Copper, tons	36,100
Petroleum, barrels (42 gals.)	3,568,000
Gold, value	$1,000,000
Silver, pounds	572,000
Vanadium ore, tons	10,600
Coal, tons	416,000
Tungsten ore, tons	75
Lead, tons	618
Salt, tons	29,800
Bismuth, tons	8,500
Borates, tons	280
Imports	$59,390,000
Exports	$130,906,000
Miles of railway	1,984
Teachers in public schools	5,431
Pupils enrolled	201,370

Peru, Ind., the county seat of Miami County, is 74 miles north of Indianapolis on the Lake Erie & Western, Chesapeake & Ohio and Wabash railroads, and on the Wabash River. It is also the division point for three traction lines—the Indiana Union Traction, the Indiana Service Corporation and the Winona Traction, all of which afford excellent passenger and freight service.

Peru is the commercial center of a productive agricultural region, and has manufactories of foundry and machine shop products, gas engines, wagons, furniture, bagging, refrigerators, carbon and cabinets. It is the home and winter quarters of the American Circus Corporation; their grounds cover nearly 1,000 acres of land and house 5 complete circuses. A summer zoo is maintained.

Peru has good public schools and a library; the water and electric light systems are the property of the municipality. The city was founded in 1827 and incorporated in 1848. In 1920 the residents numbered 12,410.

Perugino, pā-roo-jē′nō, the name used by Pietro Vannucci, an Italian painter, in signing his pictures. He was born near Perugia in 1446 and lived till about 1524. He is recorded as having studied in Florence in a class with Leonardo de Vinci, and was a teacher of the boy Raphael. Among the first Italians to use oils, his paintings have a delicacy of sentiment that is still admired. Some of the best known are *Christ Delivering the Keys to Peter* and *The Baptism of Christ,* both painted for Pope Sixtus IV in the Sistine Chapel, *The Marriage of the Virgin, The Ascension of Christ,* and *The Martyrdom of Saint Sebastian.*

Peruvian Bark. See CINCHONA; QUININE.

Peso. See MONEY.

Pestalozzi, pĕs-tä-lŏt′see, **Johann Heinrich,** an educational reformer. He was born January 12, 1746, in Zurich, the intellectual center of German Switzerland. His father was a skilled optician; his grandfather, a village parson; his mother, the daughter of a small landholder near by. His father died ere Pestalozzi was five, leaving him to the care of a gentle, refined, indecisive mother, and a capable, domestic aunt attached to the family.

During his university course he belonged to an association of young men known as the Patriots. They busied themselves with redressing the grievances of the poor and the oppressed, a course so little to the liking of the authorities that Pestalozzi at one time was imprisoned for three days. The incident is of importance merely as indicating the drift of his mind. His health failing, he conceived the idea in 1768 of buying a piece of meadow land in the canton of Aargau and building a home and planting crops, with a view to showing the peasants how respectably and well an industrious and frugal man could live on a bit of land.

As might be expected, he was too much of a dreamer and enthusiast to be much of a farmer. Actual work irked him. He pre-

ferred to plan reform. His farming never paid expenses. In 1775, with the help of the three cities of Zurich, Berne, and Basle, he put up buildings for the reception of destitute children. He soon had fifty inmates to whom he is said to have been both father and teacher. He taught them morals and manners, grounded them in reading, writing, and the Scriptures, and instructed them in field work, housework, and the cultivation of a garden. In five years' time, however, he was obliged to break up the establishment. The peasantry were unable to help him or needed the children to work; the wealthy were indifferent and, moreover, he had no natural thrift or skill in management.

He lingered with his family at Neuhof for eighteen years, traveling and writing. How he lived is hardly clear. In 1798 the canton of Unterwalden was laid waste by the French soldiery. Pestalozzi undertook to organize an orphan asylum in an old cloister at Stanz. He soon had seventy children in charge. Here he is said to have been father, mother, supervisor, teacher, servant, and maid. In the following year the authorities turned him and his school out of doors and converted the building into a hospital.

Passing over other experiences as a teacher, and efforts to retrieve the utter wretchedness and destitution of the peasant children, we come to Pestalozzi's last school. In 1805 the canton of Vaud gave him the use of an old castle at Yverdun. Here he settled for life. Those who could afford to pay paid tuition. Assistants were employed. Pestalozzi's writings made him known. The fame of his school spread abroad. Many celebrated visitors came to see. Young Froebel, then an instructor at Frankfurt, tramped across country to visit him. Herbart, the famous educator, came and wrote that he was so charmed with the earnestness and the spirit of concert reading that it impressed him like the music of a choir, and that he had to resist an impulse to put off the attitude of visitor and to join with the children in their happy work.

So far as the art of teaching is concerned Pestalozzi was crude. Nevertheless he contributed one fundamental idea. He insisted that children should not be allowed to memorize merely, but should be led, step by step, to understand. So far as pertains to the spirit of teaching, he was the kindly apostle of a new day in the German schoolroom. German teachers are still harsher than American teachers, but they owe much to the example and precept of Pestalozzi.

Between Neuhof and Yverdun he wrote two books, *Leonard and Gertrude* and *How Gertrude Teaches Her Children.* They are simple, sympathetic, educational classics. Bearing in mind the wretched, poverty-stricken villagers of the day, the barrenness of village life, and the harsh methods that prevailed, the reader can gain from these little volumes the ideas that made Pestalozzi famous.

In 1825 he left Yverdun to quarrelsome associates and, now a grayhaired man of seventy-nine, turned his back on his life work. "It seems to me," wrote he, "as though in retiring I were putting an end to my very life." None the less, he sought every opportunity to speak in public and in the classroom on the proper method of teaching young children. He died at Brugg, February 17, 1827. He was buried at Birr, the village on the border of which Neuhof stood. On the hundredth anniversary of his birth the authorities of the canton caused a memorial tablet to be affixed on the gable end of the schoolhouse of Birr. It bears these words, in German, of course:

> Here rests Heinrich Pestalozzi, born in Zurich, the 12th of January, 1746. Savior of the Poor at Neuhof, at Stanz the Father of Orphans, at Burgdorf the Founder of the People's School, at Yverdun the Instructor of Mankind—Man, Christian, Citizen. All for others, nothing for himself. Peace be to his Ashes!
>
> To Our Father Pestalozzi,
> Grateful Aargau.

Pesth. See Budapest.

Petain, Louis Philippe, (1856——), a celebrated French general, the hero of the defense of Verdun, was born near Calais and educated at the military school at Saint Cyr. At the outbreak of the Great War he held the rank of colonel, but he was given command of a brigade in the First Army Corps. The distinguished conduct of this brigade in the retreat from Charlevoi to the Marne, caused its commander to be promoted to the general of a division,

and soon after he was made commander of an army corps. In the spring, 1916, Petain was placed in command of the army around Verdun, where his heroic defense placed him among the foremost military leaders of his time. In 1917 he was made supreme commander of the troops on the western front. In November, 1918, he entered Metz at the head of his victorious army, and in that city the following December he was presented with the baton of a marshal of France.

Peter, Saint, whose first name was Simon, an "apostle of Jesus Christ." Except that which can be learned of him in the New Testament, there is little to be known definitely of his history. He was a brother of Andrew, Christ's first disciple, and it seems that they had a house together at Capernaum where with James and John they followed the pursuit of fishing on the Lake of Gennesaret. He was married, and his wife went with him when finally he left his home to preach the gospel. The course of his life after this is uncertain though he is known to have been a "pillar of the church," and to have been at both Rome and Antioch. It is probable that he suffered martyrdom, though hardly, as tradition has it, on the same day as Paul. His character is proverbial for its impulsiveness. The denial of Christ in the garden is often cited as an instance of this, though Peter was quite as ready to defend as to deny. Peter on one of his missionary journeys founded the first Christian church at Rome. The fact that this was the only apostolic church in the West coupled with Christ's words, "Thou art Peter, and upon this rock will I build my church," as narrated in Matthew xvi : 18-19, forms the basis for the papal claim of spiritual supremacy, since the popes are considered as the legitimate successors of Peter.

Peter I (1672-1724), emperor of Russia, known also as Peter the Great. He was born near Moscow, June 7, 1672, and died at Petrograd, February 8, 1724. He was the third son of the Czar Alexis. His predecessor, his older brother Fedore, died 1682. His second brother Ivan was a man of feeble mind. After much intrigue Peter and Ivan were proclaimed czars jointly, with a sister, Sophia, regent. Peter betook himself to the study of mathematics and military tactics. In 1689 he married into an influential family by whose assistance he ventured to send his sister Sophia to a convent to end her days. Though Ivan did not die until 1696 Peter was virtually sole emperor, but the two names were associated in the ukases of the empire.

Thus, at the early age of seventeen, Peter found himself absolutely master of an inland Asiatic empire. The people of Russia were adherents of the Greek Church, but otherwise they had no tie with the rest of Europe. The country had no water frontage save on the Arctic Ocean. Its commercial interests were chiefly with the caravan trade of eastern Asia. It was Peter's mission to make Russia a country of Europe, and this he proceeded to do against the strenuous opposition, not only of the priesthood, but the nobility of the country. His first care was to reform the army. Under the guidance of a military adventurer named Lefort from Switzerland, but of Scottish descent, he organized the loose militia of Russia into a compact standing army. For this purpose he studied the military system of Austria. He required the sons of nobility to serve in the army and to rise from the ranks by a regular system of promotion instead of receiving office through favoritism. His next step was to take the Sea of Azov and obtain a footing on the Black Sea. He then left his capital under the military command of one Gordon and set out on a tour through Europe. Arsenals and manufacturing establishments were visited. Instruments and models were purchased and sent home to be imitated. He cruised on board Dutch and English ships. Whenever he found a workman, an architect, an officer, or an engineer of ability, he invited him to come to Russia under promise of liberal pay. In this way he attracted no small number of men of ability to his empire. For want of funds Peter's promises of reward were not always well kept. He made a thorough study of government administration, methods of collecting taxes, and the like. His heart was set on making Russia a naval power. In order to learn the details of shipbuilding he labored as a common workman in a shipyard in Holland. This part of his life is well described

by John Lothrop Motley, from whose writings the following paragraphs are condensed:

One day, in the year 1697, the great Duke of Marlborough happened to be in the village of Saardam. He visited the dockyard of one Mynheer Calf, a rich shipbuilder, and was struck with the appearance of a journeyman at work there. He was a large, powerful man, dressed in a red woolen shirt and duck trousers, with a sailor's hat, and seated, with an adze in his hand, upon a rough log of timber which lay on the ground. The man's features were bold and regular; his dark brown hair fell in natural curls about his neck; his complexion was strong and ruddy, with veins somewhat distended, indicating an ardent temperament and more luxurious habits than comported with his station; and his dark, keen eye glanced from one object to another with remarkable restlessness. He was engaged in earnest conversation with some strangers, whose remarks he occasionally interrupted, while he rapidly addressed them in a guttural but not unmusical voice. As he became occasionally excited in conversation his features twitched convulsively, the blood rushed to his forehead, his arms were tossed about with extreme violence of gesticulation, and he seemed constantly upon the point of giving way to some explosion of passion or else falling into a fit of catalepsy. His companions, however, did not appear alarmed by his vehemence, although they seemed to treat him with remarkable deference; and after a short time his distorted features would resume their symmetry and agreeable expression, his momentary frenzy would subside, and a smile would light up his whole countenance.

The duke inquired the name of this workman and was told that it was one Peter Baas, a foreign journeyman of remarkable mechanical abilities and great industry. Approaching, he entered into some slight conversation with him upon matters pertaining to his craft. While they were conversing a stranger of foreign mien and costume appeared, holding a voluminous letter in his hand; the workman started up, snatched it from his hand, tore off the seals and greedily devoured its contents, while the stately Marlborough walked away unnoticed. The duke was well aware that, in this thin disguise, he saw the Czar of Muscovy. Peter Baas, or Boss Peter, or Master Peter, was Peter, the despot of all the Russias, a man who, having just found himself the undisputed proprietor of a quarter of the globe with all its inhabitants, had opened his eyes to the responsibilities of his position, and had voluntarily descended from his throne for the noble purpose of qualifying himself to reascend it.

The doings of Peter form so important a part of the period in which he lived, that it is difficult to give a brief account of them. He extended his dominions at the expense of the Turks, the Poles, and the Swedes. May 27, 1703, he laid the foundation of a new city, Petrograd, on the Neva. In 1713 he transferred his government from Moscow to Petrograd. Twice he crushed a revolt of his bodyguards with great severity, that is to say, he had the heads of the principal offenders stricken off. He obliged his subjects to adopt a European garb by laying a heavy tax on the long Tartar robes then customary. He emancipated his countrywomen from the Turkish seclusion to which they had been accustomed and allowed them to show their faces in public. He reformed the calendar. He adopted improved methods of collecting taxes and paying obligations. He had himself made the virtual head of the church, a position retained by his royal successors. He introduced improved breeds of cattle and horses, set up manufactories of arms, tools, and implements, and introduced the weaving of various kinds of cloth. He opened up the mines of Russia and established forges. He ransacked Europe for skillful workers in metal to teach his people. He ordered a canal constructed between the Don and the Volga. He established schools of navigation and mathematics. In 1724 he founded the Academy of Sciences at Petrograd.

Peter's domestic life was not a particularly pleasant one. He divorced his first wife on the plea that she sided with the reactionary party, that is to say, the nobles who were striving to preserve the Asiatic features of Russian society. At all events, he married a Swedish adventuress, whose name he changed to Catharine, and whom he made his successor. The reactionary party mentioned had great hopes of carrying their policy into effect under the rule of Peter's oldest son, Alexis. The latter appears to have entered into a conspiracy with the probable purpose of dethroning his father. Alexis was arrested and thrown into prison, where, it is whispered, he died under repeated torture inflicted with the purpose of learning the names of the unfortunate young man's assistants.

One school of historians claims that Peter "knouted Russia into civilization." They admit that he cared a great deal for his country, but, like other Russian autocrats, had little regard for the wishes or will of the common people. Others regard him as "the true father of his country."

All will agree that he was a man of genius and tremendous energy, and that he accomplished wonders for Russia in the face of bitter and treacherous opposition both at home and abroad. We are indebted to Motley for the following paragraphs also:

In the vast square of the admiralty at Petrograd stands the celebrated colossal statue of Peter the Great. . . . He waves his hand as if, like a Scythian wizard as he was, he had just caused this mighty swarming city, with all its palaces and temples, to rise like vapor from the frozen morasses of the Neva with one stroke of his wand. In winter, by moonlight, when the whole scene is lighted by the still cold radiance of a polar midnight, we defy any one to pause and gaze upon the statue without a vague sensation of awe. The Czar seems to be still presiding in sculptured silence over the colossal work of his hands; to be still protecting his capital from the inundations of the ocean, and his empire from the flood of barbarism which he always feared would sweep over it upon his death.

It is impossible not to admire his genius, his indomitable energy, his unconquerable will. He proposed to himself, while yet a youth, the mighty task of civilizing his country and of converting an Asiatic empire into a powerful European state. But while we admire the concentration of purpose which sustained him throughout his labors, we cannot help deploring the great and fundamental mistake which made them all comparatively worthless. A despot by birth, education, and temperament, he never had a glimmering notion of the existence of a people.

It is difficult to judge him justly. Perhaps it would have been impossible to have planted the germ of civil or even social liberty in such a wilderness as Russia was at his accession. It was something to lift her ever so little above the waves of barbarism, where he found her "many fathoms deep." He accomplished a great deal. He made Russia a maritime country, gave her a navy and commercial capital, and quadrupled her revenue. If he had done nothing else, he would for these great achievements deserve the eternal gratitude of his country.

Peter I, called Karageorgevich (1846-1921), a Serbian king, was born at Belgrade. When Alexander, his father, was forced to abdicate his throne in 1858, he took his son Peter to Hungary, where he studied. Later Peter attended the French military academy at St. Cyr, and became an officer in the French army. He fought very courageously in the Franco-German War, and was captured three times, but suffered no harm. After the war he indulged in considerable extravagance and dissipation, until he awakened to the fact that the Balkans were in dire distress. He immediately bestirred himself, and in a series of wars in 1877-78 called the Russo-Turkish War, he brought about the complete freedom of his native country, Serbia. In 1883 he married the Princess Zorka of Montenegro.

In 1903 when King Alexander of Serbia and his wife Draga were assassinated, Peter was immediately elected king, and so returned to Belgrade as monarch after forty-four years of exile.

Peter the Hermit, the preacher of the first crusade. Little is known of his early life except that he was a monk born near Amiens. He is reputed to have attempted a pilgrimage to Jerusalem but to have been turned back by the infidels ere he reached the Holy City. After the great council at Clermont at which the decision was reached to attempt the liberation of Jerusalem, Peter journeyed through southern France, preaching a "Holy War" against the Saracens. He was clad in a hermit's robe and rode on the back of a mule, carrying an elevated crucifix in his hand. At the wayside, in villages, in inns, in churches, in short, everywhere opportunity offered, he inflamed the peasantry with stories of the maltreatment of pilgrims in the Holy Land and urged an immediate march upon the Saracens. He placed himself at the head of an ignorant, unorganized, unarmed horde of peasants said to number 30,000. They set out for the Holy Land almost without supplies. They swept like a desolating scourge down the valley of the Danube, perishing by the thousand from fatigue and disease and from the attacks of the native Christians who aimed to save their small belongings from pillage. A small remnant that reached the Bosphorus were massacred by the Turks. Peter appears to have preserved his own life and to have attached himself to a body of well armed crusaders who followed soon after. July 8, 1099, he had the satisfaction of preaching on the Mount of Olives. He entered the city of Jerusalem with the crusading army. He returned soon after to France and entered a monastery of which he became the prior. He died July 8, 1115. See CRUSADES.

Peterborough, Ontario, the county town of Peterborough County, is an important industrial center. The city is on the Oto-

nabee River, a part of the Trent Canal system, and on the Grand Trunk and Canadian Pacific railroads, 75 miles northeast of Toronto. Of great importance to the industrial life and development of Peterborough is the hydro-electric power developed here. The city has grown rapidly, and now contains plants for the manufacture of electrical machinery and appliances, agricultural implements and machinery, milk separators, clocks, brake lining, boots and shoes, gummed and coated paper, harness, cereal foods, flour, lumber, mining and mill machinery, small hardware turbines, silk and knit goods, Canadian tweeds, canoes and motor boats, carpets, tents and awnings, pork products, and many other commodities. Iron, gold, silver, lead and mica are mined in the vicinity.

Peterborough is the seat of a Roman Catholic bishop, and has a cathedral and many fine churches. Among the city's educational institutions are the public graded and separate schools, normal schools, a collegiate institute, high school, business college and library. The city is well laid out with broad, paved streets and has seven parks. It is the center of an increasing tourist traffic to the Kawartha Lakes, which are in the immediate vicinity. The city is approached from Lake Ontario by good provincial highways as well as by the Trent Canal. The electric light and water plants are the property of the municipality. In 1921 the population was 21,439.

Petersburg, Va., a port of entry, is on the Appomattox River and the upper Appomattox Canal and on several railroads. It was once included in Dinwiddie County, but is now independent of county authority, being situated at the point where Dinwiddie, Chesterfield and Prince George counties meet. It is at the head of navigation on the Appomattox River, 22 miles south of Richmond. Aided by good water power it manufactures tobacco products, clothing, trunks, silk, knit goods and machinery. It does an extensive trade in fruits, tobacco, peanuts and lumber.

This city was settled in 1733 on the site of an Appomattox Indian village that was destroyed in 1676. During the Revolution, the British under General Phillips twice occupied the city. Because it was a railway center of supply from the South, it was the scene of much fighting in the Virginia campaign of 1864-1865. It was besieged by Grant from June, 1864 to April 1865, and Lee, after the battle of Five Forks, was forced to evacuate both Petersburg and Richmond. Petersburg is the home of a number of educational institutions and contains the State Hospital for the Insane. Population, 1920, 31,002.

Petersburg, Siege of, the siege that marked the close of the War of Secession. It lasted for eleven months, from June, 1864 to April, 1865. With its end came also the close of the campaign against Richmond, Virginia. After numerous plans on both sides had failed, and both Grant and Lee had become weary of the undertaking, the Confederates were defeated at the Battle of Five Forks, April 1, 1865. Two days later Grant again defeated the South and captured Richmond, and April 9 Grant and Lee met at Appomattox Court House, where negotiations for surrender were arranged.

Peter's Pence, Peter Penny, or **Rome Scot,** an ancient tax paid by England on August 1—the festival of Saint Peter ad Vincula—for the benefit of the pope. It is supposed to have been levied for the support of a school for the Saxons, with church and hospice adjoined. It was paid as early as 721 and was continued interruptedly until 1534, when it was abolished by Henry VIII. It was re-instated by Mary, only to be abolished again by Elizabeth. Charlemagne is said to have introduced the tribute into France, Casimir I into Poland, Olaf into Sweden, and Knut into Denmark and Norway. At the end of the eleventh century the payment of the pence had grown to be almost a universal custom in Europe, although the original purpose for which it was collected had been long since forgotten. The value of the penny varied. During the nineteenth century after the establishment of the monarchy, the pope revived the contribution.

Peterson, William (1856-), a Canadian scholar and college president. He was born at Edinburgh, and educated at the university of that city, at Göttingen, and

at Oxford. From 1879 to 1882 he was assistant professor of humanity in the University of Edinburgh and for the succeeding three years was principal of Dundee College in Dundee. In the English School system the principal of a college or university occupies the same position as the president of such an institution in the United States. In 1895 Dr. Peterson came to Montreal as principal of McGill University. He is a notable Latin scholar, and has edited numerous Latin works.

Petition, a formal statement to a ruler or government requesting the granting of a favor or the passing of desired legislation. A petition consists of two parts, a formal statement of the request made and a list of signatures. In order to avoid throwing the brunt of the petition upon the one who signs first, sailors long since invented a form of signature called the round robin in which each man places his name on the spoke of a wheel, or in the circumference of a circle. The right to petition the sovereign was granted by King John by the famous Magna Charta signed at Runnymede, but it was not recognized as an "inalienable right" until the passing of the Bill of Rights in 1689. The framers of the United States Constitution took the view that the colonists inherited this right. They merely inserted a provision to the effect that Congress shall make no law to abridge "the right of the people to peaceably assemble and to petition the government for a redress of grievances."

Among the famous petitions presented to Congress in this country were those for the abolition of the slave trade, and for the prohibition of slavery in the District of Columbia. These petitions became so annoying that a rule was passed that no further petitions on the subject of slavery should be considered. This procedure, known as "gag law," was the subject of the most acrimonious debate. John Quincy Adams led the opposition and finally in 1844 defeated the last attempt to prevent petition.

A statute of Parliament requires that public petitions should be couched in the following terms:

We, your Majesty's most dutiful and loyal subjects, the Commons of the United Kingdom, do most humbly beseech your Majesty that it may be enacted; etc.

In 1848 a monster petition was presented to Parliament requesting that workingmen be allowed to vote. It was signed by over a million people.

In modern times, petitions are numerous. Petitions play an important part in local life also. Petitions for a half holiday, an increase of wages, the appointment of a favorite citizen as postmaster, a change of school district boundaries, the laying out of a new road, and the granting or refusal of a saloon license are familiar examples. They are intended primarily as a means of obtaining an expression of public opinion. It is so much easier to sign than to refuse to sign, that petitions do not always obtain the consideration they would otherwise receive.

See ROUND ROBIN; CHARTISTS.

Petition of Rights, a statute of the English Parliament passed in 1628 during the reign of Charles I. The king had repeatedly evaded the constitution and had violated the rights of the people and the privileges of the commons. These grievances of the people were presented to the king as a petition, embodied in a parliamentary statute. It enumerated the different statutes violated by the king, provided that thereafter no taxes should be levied without the consent of Parliament; that no one should be arbitrarily imprisoned; that soldiers and sailors should not be quartered upon the people in time of peace. Charles I was obliged to give an unwilling assent, but soon violated its provisions. The Petition of Rights is regarded as the second of the three great documents in the development of the English constitution, the others being Magna Charta, 1215, and the Bill of Rights, 1689.

Petrarch, pee'trark (1304-1374), an eminent Italian poet. He ranks not only as one of the four great Italian poets, but as one of the first men in the great movement known as the revival of learning. He was born at Arezzo, thirty miles southeast of Florence. His father was a Florentine lawyer, a notary of ability. During the factional quarrels of the blacks and whites he was driven from the city, and, being unable to obtain employment, left Italy with his family when Petrarch was but seven years old. During this period, however, the lad had learned the Italian language in the re-

gion of its greatest purity. The family settled at Avignon in Provence, whither the popes had also transferred their court temporarily. Here the youth came under the influence not only of the culture of the papal court, but became imbued with the traditions and songs of the troubadours. Later he was sent to study law at the universities of Montpellier and Bologna. He distinguished himself less as a student of law than as a writer of Latin verse.

He returned to Avignon, where his talent for Latin versification commended him to the attention of Pope John XXII. Petrarch took minor orders in the Catholic church and held various unimportant ecclesiastical positions. In 1336 he went to Rome, where he busied himself in studying the antiquities of the place. During his lifetime he traveled not a little, delving in the libraries of various monasteries and universities. He unearthed a number of valuable Latin manuscripts, and had the reputation of being the most critical Latin scholar of the day. Later in life he was employed by the popes on various diplomatic missions. In 1354 we find him acting as a representative of Milan in a negotiation of peace between the republics of Genoa and Venice. Returning to his literary life, we find that, from 1337 to 1340, he lived on a small estate at Vaucluse near Avignon. Here he wrote a number of sonnets in the Italian language, inspired by a lady, real or imaginary, named Laura, whom tradition states he first saw in the church of St. Claire in Avignon. Later in life he wrote many works in Latin, including letters and various historical, political, theologic, and geographical treatises. His Latin is now forgotten. His sonnets and other poems are treasured. These serve to fix the spelling and the meaning of a great number of Italian words. His relationship to modern Italian is much like that of the King James Bible to modern English.

See DANTE.

Petrel, pĕt′rĕl, a family of birds akin to the gull, the tern, and the albatross. There are some seventy species distributed over the world. They rarely visit the shore save to nest. The female deposits a single white egg in a crevice in the rocks or in a hole dug in the sand. It is difficult to distinguish the larger petrels from the gulls. They have the same habit of following sea-going ships, watching with glittering eye for any bits of food that may fall or be thrown overboard. When crumbs are scattered the petrels fall behind until the last crumb is gathered. Then a few rapid, graceful strokes bring the flock up again to swoop tirelessly alongside, across the course of the ship, or in its wake. The flight of the petrels is certainly the poetry of motion. The best known of all the petrels is the stormy petrel or Mother Carey's chicken. It is a sooty black little fellow about five and one-half inches in length. A ring of white surrounds the rump. The entire bird is no larger and seemingly no stronger than a blackbird. The entire family is named from this bird. The word petrel means Little Peter. It has reference to the Apostle Peter, who tried to walk the waves of Galilee. The little petrel can rest on the waves, but it is neither a diving nor a swimming bird. It flies along in the trough of the sea, paddling the water with a pair of weak, webbed feet. It makes its living apparently by gathering small insects that float on the surface of the ocean. No matter how rough the sea it seems to enjoy itself.

Petrie, [William Matthew] Flinders (1853-), an English Egyptologist who is a world authority on his subject, was born at Charlton, Kent, England, and was privately educated. From 1875 to 1880, Mr. Petrie was engaged in exploring British archeological remains, and in the latter year turned his attention to Egypt, where from 1880 to 1921 he was engaged in excavation and research. Through his efforts a wealth of material throwing light on ancient civilizations has been unearthed. In 1884-86 he directed excavations proving the ancient Greek settlement of Naucratis and Daphnae, and in 1888-90 he discovered at Fayum papyri of great interest. Mr. Petrie also found traces of prehistoric Egyptians at Koptos and at Naquada, and inscriptions of the Israelite war at Thebes. He uncovered the city of Onias and the palaces of Memphis and Tarkhan. Mr. Petrie has written extensively on his subject. Important among his publications are *Inductive Metrology, Racial Portraits,*

Pyramids and Temples of Gizeh, Tools and Weapons, Eastern Exploration, Syria and Egypt, Heliopolis, Arts and Crafts in Egypt, Some Sources of Human History, Prehistoric Egypt, Amulets, The Formation of the Alphabet, Memphis, Growth of the Gospels, Personal Religion in Egypt and *Ten Years' Digging.* See EGYPT.

Petrified Forest, The, a name given to a remarkable region of petrified trees in Arizona. Large deposits of petrified wood may be found in various parts of New Mexico, Utah, Wyoming, and California. There is an abundance of petrified wood in the Yellowstone National Park. There are numerous localities in Arizona where petrified wood occurs in abundance, but the petrified forest is probably the most remarkable fossilized forest region in the world. In 1908 Congress set aside some 3,000 acres in Navajo County, embracing the scenic part of the region, as a government reservation. This stone forest lies in the mesa country near the railway station of Holbrook on the Santa Fé route.

The geologist accounts for the origin of the petrifactions by supposing that a noble forest was overwhelmed by a volcanic outburst. The volcanic material packed in around the trees both standing and fallen. As fast as the vegetable tissue of the wood decayed and was carried away its place was occupied by mineral matter. The geological formation of the country is full of interest. Aside from the petrified wood, the shales, clays, and sandstones of many colors have been eroded into bizarre shapes rivalling those of the Bad Lands. These softer materials have been weathered by countless ages and have been carried away by water. When the supporting rocks were worn away, the brittle, heavy, petrified trees, being without support, fell into fragments, leaving the surface strewn with chips, branches, blocks, and trunks of a pine forest now turned into stone.

One ravine and canyon has been washed out, leaving a natural bridge of the petrified trunk of a fallen pine. The roots of the old tree are buried in one bank. The top is hidden in the other bank. This forest bridge is forty-four feet long and is thirty feet above the bottom of the canyon. Recently it has shown signs of cracking and falling, as thousands of other brittle trunks have done, but the government caretakers have built two abutments to prevent disaster. The old tree trunks have been turned into chalcedony, opal, and agate. Sections resemble onyx and jasper. The fragments are as heavy as lead. The blocks that lie everywhere show not only the grain of the wood but even the knots. There is seemingly every shade of red, yellow, purple, and lavender.

Formerly a large business was done in hauling away this stone for exhibition and for the manufacture of table tops and similar articles, but the government has thought well to put a stop to the practice. Visitors may carry away chips as mementos.

Petrograd, formerly Saint Petersburg, the capital of Russia, is 400 miles northwest of Moscow, on the delta of the Neva River and on the eastern extremity of the Gulf of Finland. It was the seat of the Russian government and, before the revolution of 1917, was one of the largest cities of Europe.

DESCRIPTION. The Neva divides the city into two unequal parts, the larger of which is on the left bank. The remainder is built on the series of islands formed by the branching of the river. The left side of the Neva is lined with palaces, sumptuous residences and the Admiralty with its beautiful surrounding gardens. From the Admiralty, which is the center of the city, three long streets—the Nevsky Prospekt, Gorokhovaya Ulitza and Voznesensky Prospekt—radiate. The first is the chief street and the one that figured so largely in the first news of the revolution, which centered in Petrograd. The Duma, Cathedral of Our Lady of Kazan, Anitchkov Palace, Imperial Library, Alexander Theater and a number of fine monuments line this street. In the neighborhood of the Admiralty are also the Field of Mars, Palace Square, Senate Square, Marinsky Palace, Cathedral of St. Isaac, Cathedral of St. Peter and St. Paul (built on an island in the Neva), the fortress of Peter and Paul, the Bourse and the Winter Palace.

The Neva formerly overflowed its banks each year, but is now confined within banks

of granite and spanned by about 125 large and small bridges. The Alexander Bridge is particularly noteworthy, and the Troitsky and Nicholas bridges are handsome.

The principal educational institutions are the University of Petrograd, Academy of Arts, Academy of Sciences, Institute of Civil Engineers, Alexander Lyceum, Medical School, numerous special and technological schools, art galleries, libraries and historical museums. Since early in its history the city has been the intellectual center of Russia.

Industry and Commerce. Though the large Russian cities are (1923) in a state of economic chaos and though the population of Petrograd has declined greatly, the city is still second only to Moscow in commercial and industrial importance. There are hundreds of large and small manufactories, engaged in making cotton and woolen goods, rubber goods, glass, iron, hardware, paper, chemicals, stone products and tobacco products. The largest publishing houses in Russia are in Petrograd. Since 1885, when the canal to Kronstadt was completed, Petrograd has been a seaport, and an extensive import and export trade is carried on.

History. A settlement was made at the mouth of the Neva by a colony of Swedes in 1300. This was destroyed in 1301 by Novgorod, but that city founded a number of colonies along the river in the fourteenth century. Until the second quarter of the seventeenth century Novgorod or Moscow controlled the territory for which Petrograd is now the center; then the Swedes regained control and built a fortress on the Neva delta. This was taken by Peter the Great in 1703. In the same year he laid the foundations of the fortress of Peter and Paul and thus made the nucleus of the future capital. By 1712 the city had been so far built that the royal family removed there, and by the time of Peter's death it had attained to large proportions. Subsequent Russian rulers contributed to the city's advance and in the reign of Nicholas I it was connected by rail with Moscow and all other important Russian cities. Because "St. Petersburg" was considered a German name, the name Petrograd, the Russian equivalent of St. Petersburg, was adopted in 1914. In 1912 the population was 2,018,596, but this had decreased to 705,000 in 1920.

Petroleum, a natural rock oil that is composed chiefly of hydrocarbons and stands in the middle position in the list of bitumens, with natural gas above it and asphalt below it. In an ascending scale the list contains a solid, a liquid and a gas; but the liquid, petroleum, contains some of the elements that characterize each of the other members of the series.

History. Petroleum is of very wide distribution. In the form of a rock seepage or a pond scum it was known to the ancients, and is mentioned in the accounts of Nineveh and Babylon. The early Romans collected petroleum and used it in its crude form as fuel for lamps—for lamps, that is, of the open container type in which a rag or a porous rush was used as a wick.

But not until the nineteenth century did the petroleum industry begin. The place of its origin and the country that has continuously led the world in petroleum production, is the United States. As early as 1829 a producing well was drilled near Burkesville, Ky., but the oil was permitted to flow to waste on the surface of the Cumberland River. At this time the principal use of petroleum was as medicine, and the supply from one small well was infinitely greater than the demand. A producing company—the Pennsylvania Rock Oil Company—was organized in 1854, and a well that flowed from 400 to 1,000 barrels a day was drilled. But not until 1859, when Colonel E. L. Drake completed a well near Titusville, Pa., was the American petroleum industry established on a sound basis.

Geologic Occurrence of Petroleum. Petroleum is almost always found in beds of sand between layers of rock, and until a passage is made through the upper layer with a drill, the fluid can move—if it move at all—only laterally. It is found in all geologic formations from the Lower Silurian to the Tertiary (see Geology), but the Silurian, Devonian and Tertiary deposits are the most important. The lat-

eral movement of petroleum has been proved by the fact that, if two pools lie near each other and have any kind of passageway between them, both may be drained by drilling into one, for the gas that is never absent from petroleum deposits and an inherent chemical affinity causes a movement of the entire body toward the nearest vent.

DISTRIBUTION. The greatest petroleum deposits so far discovered are in the United States. After the Kentucky and Pennsylvania discoveries, the industry moved westward through Ohio, Indiana and Illinois to Kansas, Oklahoma, Arkansas, Louisiana and Texas, and later to California and Wyoming. Other states have small deposits, but the above are the principal producers. The next country in importance is Mexico; here the fields are confined rather sharply to the state of Tamaulipas and the city of Tampico. The next great producer is Russia, whose chief field is Baku. The following countries have petroleum deposits that are commercially valuable now (1923); other countries having great potential petroleum wealth are not named because, for one or another reason, the deposits are not, or cannot be, worked. The following are listed in the order of their 1920 production: Dutch East Indies, Persia, India, Rumania, Poland (Galicia), Peru, Japan and Formosa, Trinidad, Argentina, Egypt, British Borneo, Venezuela, France, Germany, Canada, Italy, Algeria and England. One of the most important recent petroleum finds was made in the Northwest Territories of Canada, on the Mackenzie River about 150 miles south of the Arctic Circle. Thus it is seen that this valuable fluid is found in the Arctic region and in the torrid zone; in North and South America; in Europe, Asia, Africa and on a goodly number of the large islands.

PRODUCTION AND TRANSPORTATION. In a general way, the method of drilling for petroleum is the same as for water; the tools are heavier and the depth is greater. As the drill descends, the well is cased with iron pipe—the size of which diminishes as greater depths are reached—to exclude water and prevent caving. Though most producing wells must be pumped, some begin as "gushers"—flowing wells—and continue so for weeks, months or even years. Some gushers "come in" with such violence that tools and casing are expelled from the hole, the derrick is demolished, and much oil is lost before the rampant column can be brought under control. The greatest American gushers have occurred in Texas and California, and many Mexican wells have had a large initial flow.

For the reason that a train of tank cars is a common sight on American railroads, it is usual to suppose that petroleum is largely shipped in these cars. Such is not the case. By far the greater part of American crude oil is transported by way of pipe lines, which are buried in the ground and are therefore seldom seen except in the oil fields. These lines form a great commercial web under the central United States and branch out to the three coasts. The total length of pipe lines is well upwards of 35,000 miles, and the longest single line is about 1,700 miles.

REFINING. Petroleum in the crude state is used as fuel on railroads, in ships and under stationary boilers, and for oiling roads and making water gas; but for other purposes it must be refined. The total of petroleum by-products runs into the hundreds, but of all, gasoline is at present the most important and seems likely to continue so. See GASOLINE.

Simply stated, the refining process consists in distilling the crude oil and purifying the distilled product. Crude oil is placed in large metal retorts and agitated —stirred—at the same time that it is subjected to heat of increasing temperature. The more volatile substances are the first to pass off; the others follow in the order of their weight, leaving, at the last, a sediment which is also drained off and used in various ways.

The refineries of the United States used —"ran" —approximately 435,000,000 42-gallon barrels of crude oil in 1920 and produced 4,882,546,649 gallons of gasoline; and approximately 2,320,000,000 gallons of kerosene; 8,861,000,000 gallons of fuel and gas oil; 1,047,000.000 gallons of lubricating oil; 1,492,000,000 gallons of mis-

cellaneous oils; 541,000,000 pounds of wax; and 1,290,000 tons of asphalt. Bayonne, N. J., and Whiting, Ind., are the largest American refining centers.

PETROLEUM AND THE WORLD WAR. It has been said with little or no exaggeration, that petroleum won the war for the allies. The speeding up of the metallurgical industries to meet war demands called for more more lubricants and more fuel oil than had ever before been required; and the use of motors for transport and aeroplanes for scouting and fighting duty made heavy demands on the refineries for gasoline. More oil burning ships appeared upon the sea; petrol launches came largely into use; and helium, an oil by-product, was needed for semi-rigid and dirigible balloons.

After the Russian revolution Mexico and the United States, chiefly the latter, were the greatest sources of supply. The oil fields and refineries were run at full capacity, and new demands were met by new operations. Productian did not relax after the war, for since 1916 the total of refinery products has increased each succeeding year.

The following is a table of production for the year 1921 for all countries for which exact statistics are available. The figures are for barrels of 42 gallons:

Country	Barrels
United States	469,639,000
Mexico	195,064.000
Russia	28,500,000
Dutch East Indies	18,000,000
Persia	14,600,000
Rumania	8,347,000
India	6,864,000
Poland (Galicia)	3,665,000
Peru	3,568,000
Jepan and Formosa	2,600,000
Tirindad	2,354,000
Argentina	1,747,000
Egypt	1,181,000
Venezuela	1,078.000
France	392,000
Germany	200,000
Canada	190,000
Italy	35.000
Algeria	3,000
England	3,000

Petunia, a well known garden flower. It is a South American relative of the tobacco plant. The name petunia is Indian, signifying tobacco. There are from twelve to fifteen species, all native, from Mexico to South Brazil. They are clammy-hairy, branching herbs, with small, entire leaves. The wild flowers vary from white to a showy violet.

Pewee. See PHOEBE; WOOD PEWEE.

Pewter, pū′tẽr, an alloy of four parts of tin with one of lead, known also as Britannia metal. It stands more heat and is firmer than either metal alone. It is used chiefly for mugs, plates, and cheap tableware. An alloy known as plate-pewter consists of ninety parts of tin to eight parts antimony, and two parts each of bismuth and copper. Still a third pewter is composed of eighty-three parts tin and seventeen parts antimony.

Phaethon, fā′ē-thŏn, in classical mythology, the child of the Sun and the ocean nymph, Clymene. Being twitted of humble birth he was sent by his mother to the palace of Phoebus, the Sun, in the far east for proof of his ancestry. He begged the boon of being allowed to drive his father's chariot for a single day that all might know who he really was. Phoebus, having given his promise rashly, was unable to induce the youth to refrain. Seeing that nothing else would avail, he told him of the difficulty of ascending the first part of the roadway, the dizzy height of the road at another, and the steep pitch into the ocean at evening. He told him how to pass the horns of the bull, the arrow of the archer, the lion's jaws, and the arms of the scorpion and the crab. Dawn threw open the purple doors of the east, the day star marshaled the stars aside, the moon retired, the hours harnessed up the horses. As a parting word, Phoebus told Phaethon to hold tightly his reins and to spare the whip. Phaethon leaped into the chariot full of youthful confidence. The steeds felt at once that a new hand was at the rein and a lighter person in the chariot. They became ungovernable. The chariot, that is to say, the sun, passed too near the earth. It scorched the face of nature, creating the Libyan Desert. To prevent the destruction of the world Zeus slew Phaethon with a thunderbolt. He fell near the mouth of the Po. His weeping sisters were transformed into the Lombardy poplars for which that valley is noted. Their tears turned to bits of amber, still cast ashore by the waves after a storm.

Phalanx, fā′lănks, a mode of military formation adopted by the infantry of Sparta, Thebes, and Macedon. The soldiers were armed chiefly with long spears. Each carried a shield to protect himself from the darts of the enemy. The phalanx reached its greatest efficiency under Philip of Macedon. The phalanx of Philip was an oblong mass of men standing in perfect order several ranks deep. They carried spears twenty-four feet long,—so long that the points of the fifth rank extended three feet beyond the front of the phalanx, while the front spears must have extended ten or twelve feet. In all, the points of five spears bristled before the front soldier. When the spears were held upright, the soldiers could wheel to the right or to the left, or about face, as readily as though they carried muskets, but when the spears were lowered for a charge, they riveted the entire phalanx into a body of men that could move in a forward direction only but whose onset was simply irresistible. Neither footmen, horse, nor rider could stand for a moment before a bristling wall of spears with a mighty mass of men behind them. By means of the phalanx Philip organized the most efficient military force in the ancient world. With its aid his son Alexander made himself master of Asia, and made Greece for a time the foremost power of the world. See MACEDONIA.

Pharaoh, fā′rō or fā′rā-ō, a title of the Egyptian monarchs. Like shah, czar, emperor, and king, it is a general name applied to the rulers of that country. As used in the Scriptures, pharaoh is equivalent simply to the king. Attempts have been made to identify the pharaoh of Abraham, the pharaoh who was a friend of Joseph, and the pharaoh of the Hebrew Exodus, with, however, little success. The pharaoh who oppressed the Hebrews in Egypt by causing them to make bricks without straw has been identified as Rameses II. See PYRAMID; EMBALMING; RAMESES II.

Pharisees, făr′ĭ-sēs, an ancient sect of the Hebrews. They were noted for a strict observance of the letter of the law. In doctrine they held to the resurrection of the body, to the actual existence of angels and spirits, and to the paternal care of a personal God. They were scrupulous in the observance of all points of Hebrew ritual. At the time of Christ they had a reputation of being hypocritical in their lives. See SADDUCEES.

> Woe unto you, scribes and Pharisees, hypocrites! for ye devour widows' houses, and for a pretence make long prayer: therefore ye shall receive the greater damnation.
>
> Woe unto you, scribes and Pharisees, hypocrites! for ye compass sea and land to make one proselyte, and when he is made, ye make him twofold more the child of hell than yourselves.—St. Matthew xxiii: 14-15.

Pharmacopoeia. See PHARMACY.

Pharmacy, the art of compounding and dispensing medicine. The term is also applied to the place where medicine is sold, that is, the apothecary's shop, more familiarly known as the drug-store. Originally physicians were their own pharmacists, but in the United States the two professions of apothecary and practitioner have gradually evolved. The art of pharmacy has undergone a wonderful change within the past fifty years, for a revolution has taken place which has banished from the shelves of the old-fashioned drug-store the unreliable remedies of tinctures and sirups upon which the faith of the masses once rested. There is now, too, a rigid law which requires a definite examination and technical education of those seeking to practice as pharmacists. The necessary training in pharmacy is given in many universities. In this way, indiscriminate and unskillful distribution of drugs is limited and avoided as much as possible. As a further safeguard, the directions and formulas for preparing drugs are gathered in a volume known as the *United States Pharmacopoeia,* used by all pharmacists.

Pharos. See LIGHTHOUSE.

Pheasant, fĕz′ant, a genus of grouse-like birds native to southern Asia. The common pheasant of Great Britain was introduced during the thirteenth century, and has been cared for in game preserves. The male is as gaily colored as the peacock, but its tail feathers droop down the two sides of its rump not unlike the roof of a house. The head and neck are steel blue with brown, green, and purple reflections, and the feathers of the back and wings are marked with orange, red, black, brown, and yellow. The feathers of the under parts are

golden red margined with black. As it walks along, the plumage changes color like that of a pigeon. The total length is about three feet, two-thirds of which is tail. The plumage of the female is of a modest brown.

The pheasant nests on the ground like other grouse. The eggs are not infrequently removed by the gamekeeper and hatched under hens. Pheasants raised in this way are as tame as other poultry and run to be fed at the sound of the keeper's voice. As soon as they are entirely grown he endeavors to drive them out into the woods in order to have them wild enough to afford sport when the shooting season opens. Yet it not infrequently happens that pheasant shooting degenerates into a sport about as thrilling as that of walking into a barnyard and shooting tame pigeons as they rise. Pheasant raising would be attended with less difficulty were it not for foxes. The English sportsmen give strict orders that foxes are not to be disturbed against the season of fox hunting. An old vixen is capable of breaking up any number of nests and of carrying young pheasants by the dozen to her den to regale her hungry cubs. As the gamekeeper is expected to have his woods full of wild pheasants by the first day of October, it may be seen readily that his life is not without care. A field of buckwheat affords winter food and shelter.

Pheasants are protected also in France and in other countries of Europe. Queen Josephine of France was a skillful shot. Some attempts have been made to introduce the pheasant into America, but without success. The American partridge is not infrequently called a pheasant, especially in the South. As our most ornamental grouse it perhaps merits the name, but the partridge is not a pheasant. See GROUSE.

Phelps, Elizabeth Stuart. See WARD, MRS. ELIZABETH PHELPS.

Phi Beta Kappa, a Greek letter society. It was the earliest of the college fraternities. It was founded at William and Mary College in 1776. The letters are the initials of the Greek words meaning "Philosophy, the Guide of Life." The organization is now an open one. Membership is restricted to seniors who have won honorable mention for scholarship.

Phidias, fĭd'ĭ-as, the most famous of Greek sculptors. Little is known of his personal life. He was born about 500 B. C. During the administration of Pericles he had an army of sculptors at command and was intrusted with the adornment of public buildings of that period. The colossal statue of Athena in gold and ivory on the Acropolis was the work of the sculptor himself. It is understood that the marvelous friezes of the Parthenon and other buildings were designed by him and were executed under his immediate eye. As is known, a portion of this sculpture was removed by Lord Elgin to the British Museum where it may still be seen. Still another work, called by many his masterpiece, was a gold and ivory statue of Zeus in the temple of that god at Olympia.

Phidias had the disposition of much treasure and the distribution of public works on a large scale. As might be expected in a democracy where any one may raise his voice, there were not lacking those who accused him of theft. This charge was made especially in connection with the statue of Athena. Fortunately the plates of gold and ivory were attached to the statue at the suggestion of Pericles, it is said, in such a way that they could be removed and weighed. Though the account may very likely be a mere tale, the exculpation of Phidias is said to have been complete. A charge of impiety was made against him. It is said he was accused of having introduced both himself and Pericles among the figures on the shield of Athena. A bald-headed old man was identified as Phidias himself; an ideal Greek of noble form and face fighting with the Amazons was identified as Pericles. As the shield has long since disappeared this story is also a mere tradition. There is, however, in the British Museum, a marble fragment of a shield on which these figures appear. It may be seen readily, however, that this shield is a piece of later work constructed probably in accordance with the tradition. In the construction of the statues mentioned ivory was used for the bare parts, such as the face, hands, and feet. The drapery was constructed of gold tracery. Light and shade were distributed with unusual artistic skill. Enameled col-

ors were introduced into the statue of Zeus at Olympia with wondrous effect. Like all true artists Phidias sought to combine dignity and simplicity.

See SCULPTURE; ATHENS; PERICLES.

Philadelphia, Pa., is the largest city of the state and the third largest in the United States. The city is situated in the southeastern extremity of the state at the junction of the Delaware and Schuylkill rivers. From New York City, Philadelphia is distant 90 miles; from Washington, 136 miles; from Chicago, 822 miles. The area of the city is about 130 square miles.

Transportation by rail is provided by the Pennsylvania system, the Reading Railroad and the Baltimore & Ohio Railroad. Though it is 50 miles from the mouth of the Delaware River, Philadelphia is one of the most important ports in the United States.

GENERAL DESCRIPTION. Philadelphia was founded in 1682 by William Penn on a strip of land two miles wide between the two rivers. His plan was that building should proceed with equal pace northward from each of the two arms of the Y formed by the rivers, but for years extension northward was confined closely to the banks of the Delaware. About 150 years passed before the city had expanded halfway westward to the Schuylkill. Now, however, the latter has been passed by some miles. Market Street, the principal business thoroughfare, runs east and west between the rivers, and determines the general direction of all the other streets. Broad Street is the main avenue from south to north. These are beautiful streets, the first 100 and the second 113 feet wide. City Hall Square marks the intersection of the two. East of the Schuylkill less regularity of direction is noticed than obtains in the interrivel section of the city.

The popular name of the city of Philadelphia is the "City of Brotherly Love," but a more modern appellation is the "City of Homes." The latter has reference to the absence of the apartment houses comparatively to, first, New York City, which is built more perpendicularly than horizontally, and, secondly, Chicago. Even in the most modern parts of the city and in the many suburbs, the apartment house is a comparative rarity.

BUILDINGS. Philadelphia is interesting to the visitor for the number of its historic buildings, as well as for the size and architectural grandeur of some of its modern structures. One of the most impressive groups is the City Hall or Public Buildings group. The main structure is of marble; from this rises a clock tower that is more than 500 feet high and is surmounted by a heroic statue of William Penn. The important buildings belonging to the United States are the Mint, Custom House, Arsenal, Post Office and League Island Navy Yard. The latter is at the southern terminus of Broad Street.

Among the famous historic buildings are Independence Hall, Betsy Ross House, Congress Hall, Carpenter's Hall, the old City Hall, Pennsylvania Historical Society (now occupying a modern fireproof structure), Old Swedes and Old Christ Churches and the first United States Mint.

The most conspicuous among Philadelphia's more modern buildings are the Provident, Drexel and Bullitt buildings, Land Title, Girard Trust, Commonwealth Trust, Arcade, Betz, Widener and Real Estate Trust buildings, Reading Railroad Terminal, Pennsylvania Station, Stock Exchange, Export Exposition Building and the Commercial Museum. The prominent newspaper and publishing buildings are the Curtis Building, the old Lippincott Publishing House and the homes of the *Legder*, *North American*, *Record* and *Evening Bulletin*. The Ritz-Carlton, St. James, Vendig, Walton, Bellevue-Stratford and Adelphia are the most important hotels.

PARKS AND MONUMENTS. With a parked area of 4,464 acres, Philadelphia ranks next to Chicago in providing places for the enjoyment of natural beauty and for recreation. The largest is Fairmont Park, 1,956 acres, divided into a small eastern and large western section by the Schuylkill River. This contains the zoological gardens and monuments to Washington, Lincoln, Meade, Garfield, Grant, Joan of Arc, Schiller, Goethe, Father Mathew, Witherspoon and Columbus.

League Island Park, 300 acres, is the

next largest. The most famous is Independence Square, in which stands Independence Hall, Logan Square, Bartram's Garden, Penn Treaty Square and Central Square are other delightful spots.

CHURCHES AND EDUCATIONAL INSTITUTIONS. Besides the old churches mentioned above that figured in Revolutionary affairs, the most notable are Friends' Meeting ing House, the Roman Catholic Cathedral, Jewish Synagogue, Baptist Temple, Church of the Advocate, Holy Trinity Church, Tabernacle Presbyterian and First Presbyterian churches.

The leading educational insttiution is the University of Pennsylvania (See PENNSYLVANIA, UNIVERSITY OF). Drexel Institute, Bryn Mawr, Girard College, Pennsylvania Academy of Fine Arts, Central High School for Boys, Normal School, American Academy of Political and Social Science, Pennsylvania Academy of Natural Science, Temple University, Lehigh University, Medico-Chirurgical College, Episcopal Academy and numerous commercial, special and technological schools add greatly to the educational importance of the city. The Roman Catholics maintain a separate system of public and high schools, and the Friends have a number of schools.

Philadelphia has more than 100 libraries and museums; notable examples are the Free Library of Philadelphia, Mercantile Library, Hurst Library, American Philosophical Society and Friend's Library.

INDUSTRY AND COMMERCE. Philadelphia is one of the most important manufacturing and shipping cities in the United States. The industrial plants are, in the main, grouped along the rivers behind the warehouses and the wholesaling district. An industrial census of the city taken in a recent year gave 4,454 as the number of manufacturing establishments; 946 were devoted to metallurgy and 602 to the production of textiles. The largest single plant is the world famous Baldwin Locomotive Works. Other internationally known Philadelphia establishments are the Curtis Publishing Company, Stetson Hat Company, Disston Saw Works, Standard Oil Company and the Cramp Shipyards.

Philadelphia produces sheet and structural iron and steel, merchant and war ships, street railway cars, leather, oilcloth, rugs, carpets, knit goods, cotton goods, worsteds, cordage, fertilizer, tobacco products, rubber goods, dyestuffs and a great number of other articles. In production value of textiles this city usually leads the Union. Other important plants, though they are never listed as plants of the city of Philadelphia, are the League Island Navy Yard and the United States Arsenal.

As a port, Philadelphia increases in importance each year. The city is served by the steamers of 50 transatlantic and 10 coastal lines, and in 1920, 12,246,427 gross tons of shipping arrived at, and 12,820,377 gross tons cleared, the port. The exports consist of coal from Pennsylvania, the farm products of a large extent of territory to the west, and the output of the city's factories.

HISTORY. The first white settlers on the site of Philadelphia were a small colony of Swedes sent out by Queen Christina; the settlement was made in 1636, but was not permanent. An English settlement was made in 1681 by Captain William Markham, a deputy governor for William Penn (see PENN, WILLIAM.) Two years later a company of Germans settled, at Penn's invitation, at Germantown, on the Schuylkill River. The site of these settlements was industrially and commercially advantageous, and in the year 1685 the future Philadelphia was a town of 2,400 people. In 1682-83 and -84 Penn personally supervised the colony, and when he returned from England in 1699 there were 4,500 inhabitants. The city was chartered in 1701. After Penn, the most conspicuous character in the early life of the community was Benjamin Franklin (see FRANKLIN, BENJAMIN), who arrived in 1723. It was he who founded and for some years edited the Pennsylvania *Gazette,* and it was largely due to his influence that Philadelphia and its environing settlements were so aggressively anti-British. Throughout the Revolutionary War the city was the scene of many important events. During 1683-1799 it was the state capital, and was the National Capital from 1790 to 1800.

During these years the city had become

important as a commercial and literary center, though on the industrial and commercial side it was outranked by New York. True to its ideal of liberty, Philadelphia was first in protest against the institution of slavery, and in 1833 the American Anti-Slavery Society was organized here. In 1854 eleven villages were united with the city under one government, and Philadelphia was made coextensive with Philadelphia County. The Centennial Exposition to commemorate America's independence was held here in 1876; this attracted to the city the attention of the world, and thereafter Philadelphia was one of the world's most important centers of trade and learning.

Philemon. See BAUCIS AND PHILEMON.

Philharmonic Societies, a series of organizations formed for the furtherance of the knowledge and appreciation of orchestral music. The four most important centers are London, New York, Vienna and Berlin.

The Philharmonic Society of London is the oldest orchestral group in England. It was founded in 1813 by a number of music lovers, and has flourished from that time until the present day. According to the constitution as originally drawn up, no attention was to be paid to solos or concertos; only concerted music was to be permitted. However, as the members gradually divided up into quartets, less stress was laid upon this rule, until there came a time when the only restriction was that only instrumental music be used. At first the conductors of the concerts were famous composers of the time, but when it was proven that these geniuses usually possessed no qualifications for able conducting, the London Society began to invite famous musical conductors to join them.

The New York Philharmonic Society was founded in 1842, and has always consisted of professional musicians only. There have been many famous conductors of the concerts, including Carl Bergmann, Dr. Leopold Damrosch, Theodore Thomas and Anton Seidl. A million dollars was bequeathed the Society in 1912 by Joseph Pulitzer.

The Society in Vienna, founded in 1842, is known as Philharmonische Gesellschaft. Its first conductor was Otto Nicolai, who brought the organization to a high type of musical body. Since then some of the leaders have been Carl Eckert, Otto Dessoff and Hans Richter. Lately, it has popularized itself by inviting many famous European conductors as guests.

In Berlin, Edward Rietz founded the Philharmonic Society, in 1802. It was the first European musical organization to undertake a popular series of concerts at reasonable prices for the entertainment of the public. This field has since developed into a very wide one.

Philemon. See BAUCIS AND PHILEMON.

Philip II (382-336 B. C.), king of Macedon, father of Alexander the Great. He was a man of great ability. According to popular accounts he found the inhabitants of Macedon a rude lot of hill dwellers and plainsmen without seacoast or prestige. He secured seaports, subjugated surrounding tribes, and, through intrigue and despite the opposition of Demosthenes, he admitted himself to a share in the councils of Greece. He was assassinated 336 B. C. Philip took great pains with the training of his son Alexander, to whom he bequeathed a well trained mind and body, the most remarkable military organization of antiquity, the accomplished supremacy of Greece, and the carrying out of his own vast projects for the conquest of Asia. Without the preparation of money, troops, and plans by Philip, the conquests of Alexander would have been impossible. See ALEXANDER;

Philip II (1165-1223), king of France. Among the events of his reign were the banishment of the Jews, the Third Crusade, the retaking of Normandy and adjacent provinces from England, and the crusade against the Albigenses.

Philip II (1527-1598), king of Spain. He was the son of Emperor Charles V of Germany. He reigned 1556-98. He made it the chief object of his reign to restore the Roman Catholic religion throughout his dominions. He carried on a disastrous war in the Netherlands, resulting in the extirpation of Protestantism in the southern provinces and the revolt and independence of

the northern provinces. It was in his reign that the "Invincible Armada" was dispatched against England. The Philippine Islands, discovered during his reign by Magellan, were named for him.

Philippic. See DEMOSTHENES.

Philippine (fĭl'ĭp-ĭn) **Islands,** a group of islands in the Pacific Ocean. They lie the most northeasterly, the nearest China, of all groups of the great archipelago between Australia and continental China. There are in all 7,083 islands. The largest ten are Mindanao, Luzon, Samar, Negros, Panay, Palawan, Mindoro, Leyte, Cebu, and Bohol. The total area is 114,000 square miles, twice that of New England and greater than that of the British Isles. The group lies between the fifth and twentieth parallels of north latitude. The greater portion of the group is included between the meridians of 120° and 125° east longitude. When the time at San Francisco is recorded at 9 A. M. Monday, it is 1 A. M. Tuesday in the Philippines.

TOPOGRAPHY. The islands are mountainous. The interiors of the larger islands rise to a height of from 5,000 to 10,000 feet above sea level. The loftiest mountain is Apo in Mindanao, 9,610 feet high. There are some twenty active volcanoes. The rivers are numerous, swift, and brimming with water. The largest are comparable to the Thames and the Connecticut. They are navigable for small steamers. The mineral resources are not believed to be extensive. Gold and copper ores have been smelted for centuries. Lead and iron exist certainly in workable quantities. There are coal measures and petroleum wells.

FORESTS. A large part of the surface, especially the interior, is covered with forests. Botanists have named 664 species, including fifty rubber-producing trees. Many of the species afford lumber of high value to the carpenter, shipbuilder, and furniture maker. The banyan, teak, ebony, camphor, sandalwood, cocoanut, and bamboo flourish. The forests are owned chiefly by the government. Timber is cut under government permit and on payment of royalty for stumpage. A fine exhibit of Philippine woods was shown at the St. Louis Exposition.

ANIMALS. The wild animals of the Philippines are of interest largely because they have the charm of novelty. They are not well developed,—that is, high types are not numerous. The islands are rich in birds. There are over 600 species, 325 of which are not known elsewhere. There are crocodiles in the rivers, pythons in the forests, and lizards everywhere. The pangolin, deer, wild hog, island buffalo, wildcat, porcupine and the flying lemur, rats, squirrels, and bats are the principal mammals. Of domestic animals, hogs, sheep, and goats have been introduced. Chickens are native to this part of the world. The usual beast of burden is the water buffalo. The waters abound in food fishes. Pearls are found in several localities.

CLIMATE. The climate is distinctly tropical and oceanic. Around the coasts, the temperature keeps within the limits of 60° and 90° F. The temperature of the elevated interiors runs from five to fifteen degrees cooler but is subject to greater change. There are three seasons. From the middle of March to the middle of July is a hot, dry season. The succeeding four months are rainy. The third portion of the year is the coolest and the most pleasant.

AGRICULTURE. The principal food crop is rice, but the amount raised is not enough for home use. As in Hawaii the amount of coast and river land available for agriculture has been increased largely by wells and irrigating ditches. Sugar-cane grows well. It is claimed by some that the Philippines may become the leading sugar-producing region of the world. It is desirable that Congress establish tariff regulations that will make the industry profitable. Tobacco raising is a prominent branch of agriculture. Manila tobacco is the eastern rival of the Cuban article. The coffee plant grows as well as in Java but is subject to insect pests. Cocoanut groves are prominent. Spices are gathered. Manila fiber supplies the material for our cordage works. At present it is the most profitable article of production. Methods of cultivation are Spanish and are exceedingly primitive. Handwork and wooden plows drawn by slow-going buffaloes are typical of the islands.

Population. The inhabitants are difficult to classify. There are half a hundred dialects. The entire population is reported at 10,607,872. Of this number about 30,000 are blacks or Negritos. They are a dwarfish, half savage lot. They wander in small bands through the forests, living on roots and such birds and small animals as they can take. They appear to be a small remnant of the original inhabitants. The Igorrotes, of whom mention is frequently made, are a copper-colored, primitive people in the interior of Luzon. Like the ancient cliff dwellers of Arizona, they understand irrigation. Another tribe, called the Mindanaos, also have peculiar customs.

The Sulu Archipelago in the southwestern part of the Philippines is inhabited chiefly by Malay people known collectively as Moros. They come from Borneo and are Mohammedans. They have a native literature and use a modified Arabic alphabet. Formerly they were fierce pirates, and practiced slavery and polygamy. They hold their lands in common. They are a proud, fierce people, difficult to subdue and hard to govern. Their code of law and ethics is based on the Koran. They have nothing in common with the Filipinos. Under American government the Moros have been made a sort of independent people—somewhat on the plan of a state. A local legislature has prohibited slave hunting and it is expected that the more objectionable features of their social system may be amended by degrees. Physically and mentally the Moros are the most hopeful element in the island.

To the greater portion of the population the name Filipinos is applied. They are of a mixed race and speech. Negrito, Papuan, and African negro blood is present. The Malays and Polynesians have contributed a copper tint. There is evidence of Chinese, Japanese, Spanish, and even South American Indian parentage. The chief tribes are the Tagals or Tagalogs, the Bicols, and the Visayas. The Tagals are the dominant people of Luzon. The Tagalog language is the native language heard usually on the streets of Manila. They number a million and a half. They are the most advanced of the Filipinos and are engaged in agriculture and fishing.

Habits and Customs. The Filipino, that is to say, the Tagal, house is a bamboo hut thatched with palm leaves and floored with bamboo poles. The Filipino works a little and idles a great deal more. Small rice fields and poultry yards support the family. Cockfighting is described as the principal pastime. The head of the household saunters about with his fighting cock under his arm. When he meets his neighbor, he squats down to discuss the points of the two birds as Westerners discuss their dogs or race horses, or as the Chinese discuss their kites. It is said that when the hut takes fire, as it is sure to do sooner or later, the Filipino saves his game birds first, his children next.

The bamboo enters largely into the arts of the island. A lumber yard consists chiefly of well assorted piles of bamboo canes. The joints are hollow. Candlesticks and ink wells are made of small joints; spittoons, pails, and tubs of larger joints. Milk is carried to market in bamboo. The water bucket is a joint of bamboo the size of a piece of ordinary stove pipe, only two or three times as long. This the water carrier carries on his shoulder. Bamboo is used largely for bridges and ladders also, and is a general substitute for lumber.

Cities. Seven Philippine cities have a population ranging from 35,000 to 65,000. Seven have sufficient business to be designated as ports of entry. Manila, the capital, is also the metropolis of the island. It has a population about half that of Washington, D. C. It is situated on the western, that is to say, the Asiatic side of Luzon. It lies on both shores of the Pasig River. The mouth of the river expands into Manila Bay "several hours wide." The city occupies thirty-two square miles. There are four miles of wharfage. Manila proper is a walled town on the southern shore of the river. It is in the Spanish quarter. The shape of the houses, the bright paints used, the government buildings, the religious houses, the churches, and the cathedral give the city a distinctly Spanish appearance. It is laid off in rectangles. Some of the streets are paved. Showy shops, many of them conducted by Japanese, line the business streets. Drays

drawn by buffaloes, cabs drawn by ponies, and fine equipages drawn by spirited horses are seen on the streets and stone-arched bridges. Among the articles the city markets afford are chickens, pigeons, guinea-pigs, eggs, fish, rice, bananas, lemons, oranges, pineapples, breadfruit, mangoes, lettuce, cabbages, sweet potatoes, onions, bamboo shoots, and betel nuts.

HISTORICAL. The Philippines were visited by Magellan in 1521. On a subsequent visit he was killed near the present town of Cebu. The Spaniards occupied the island in 1565. Cebu was their first colony. A decade or two later Manila was surrounded by walls of hewn stone and became the seat of the government. Franciscan monks and Jesuit missionaries converted a large portion of the Filipinos to Catholicism. The Spanish authorities had difficulties from time to time with Malay, Chinese, and Moro pirates. In 1762 Manila was taken by the English, but was restored on a promise to pay a ransom of $4,000,000. As in Cuba native outbreaks against Spanish rule were frequent. One of the most noted was led by Aguinaldo. He was bought off in 1897 for the sum of 800,000 pesos and retired to Hongkong.

During the Spanish-American War an American fleet under Admiral George Dewey destroyed the Spanish ships in Manila Harbor. The naval conflict took place May 1, 1898. August 13th the city surrendered. At the conclusion, December 10, 1898, the Philippines, the Sulu Archipelago, and other territory were ceded to the United States on payment of $20,000,000. Aguinaldo returned to the island and raised a formidable insurrection, but in time he was defeated and taken prisoner.

GOVERNMENT. The government set up by the United States is composed of a governor and eight commissioners, four American and four Filipinos. A large force of officials divided into bureaus has charge of forestry, mining, public health, fisheries, public lands, surveys, patents, police, banks, railroads, justice, and many other subjects. The inhabitants are entitled to protection under the Constitution of the United States, but they do not have all the rights of citizenship. The whole of the Archipelago is under civil government.

EDUCATION. The United States has laid heavy emphasis on education for the Filipinos, and the result has been in large measure gratifying. The islands are divided into 49 school divisions, and primary schools have been established wherever possible. Special stress has been laid on industrial and agricultural education; school farms have been established; technical schools have been created; and whenever possible, English-speaking Filipino teachers are employed. Higher education has been provided for by the establishment of the University of the Philippines, a government institution with an annual enrollment of about 3,300 students.

INDEPENDENCE. For many years the civilized Filipinos have been greatly desirous of independence; but there exists such a cultural hiatus between the civilized and uncivilized, and the latter are so numerous comparatively to the former, that the practical difficulties of their case prevents acquiescence on the part of the United States. The Filipino is a ward, and must be governed in his own interest.

A delegation of Filipinos visited President Harding during the summer of 1922, and entered a strong plea for independence. Manuel Quezon closed his address for the Philippines with the following words:

> The Filipino people have fulfilled their part in the covenant with America. Their relations with the United States are of the most cordial and friendly nature. If the independence of the Philippines could now be secured as an amicable agreement between the two peoples, nay, even as an act of magnanimity on the part of a sovereign power, how much would that mean to the peace of the world! How much more would that add to the prestige of the United States when she again appears before the world as a champion of democracy and human liberty!

President Harding replied as follows:

> With every mindfulness of your aspirations, with shared pride in your achievements, with gratitude for your loyalty, with reiterated assurance that we mean to hold no people under the flag who do not rejoice in that relationship, I must say to you that the time is not yet ripe for independence.

General Leonard Wood, Governor-General of the Philippines, was to have retired on January 1, 1923, to become provost of the University of Pennsylvania, but finally declined the latter office, retaining the for-

mer. After the Filipinos entered their plea for independence in 1922 they asked that the next Governor-General be a civilian.

STATISTICS. The following are the latest reliable statistics available:

Area, square miles	114,000
Forest area, square miles	40,000
Number of islands	7,083
Principal islands:	
Luzon, square miles	40,814
Mindanao, square miles	36,906
Samon, square miles	5,124
Negros, square miles	4,903
Palawan, square miles	4,500
Panay, square miles	4,448
Mindoro, square miles	3,794
Leyte, square miles	2,799
Cebu, square miles	1,695
Population (1920)	10,607,872
Chief Cities:	
Manila	283,613
Cebu	65,502
Albay	52,756
Iloilo	48,000
Laoag	46,000
Ormoc	38,247
Zamboanga	30,000
Vigan	18,000
Naga	12,000
Members of territorial senate	24
Members of house of representatives	91
Salary of governor	$20,000
Bonded indebtedness	$3,459,281
Farm area, acres	6,471,942
Sugar cane, short tons	608,499
Tobacco, pounds	143,070,000
Corn, bushels	13,095,000
Rice, pounds	2,126,642,000
Domestic animals:	
Horses	145,000
Carabao	640,871
Cattle	127,559
Swine	1,350,000
Minerals, value	$2,900,000
Imports	$95,604,307
Exports	$65,797,031
Manila hemp exported, value	$46,807,780
Copra exported, value	$8,327,151
Cocoanut oil exported, value	$11,409,147
Hats exported	540,332
Miles of railway	778
Telegraph lines, miles	5,471
Teachers in public schools	13,227
Pupils enrolled	791,626

Philistines, fĭ-lĭs′tĭns, a people of probable Canaanitish origin. They dwelt on the southern border of Palestine, on the coast road from Egypt to Syria. They occupied five cities. It is thought, in fact, that they were a colony planted by the Egyptian pharaohs to secure the roadway. At all events they refused to mingle with the other people of Palestine and were faithful to Egyptian interests for many a century. The Philistines and the Israelites were hereditary foes. Their truces and friendships were about as lasting and sincere as those between the Sioux and the Chippewa Indians. Goliath, the giant, whom the stripling David smote fairly in the forehead, with a pebble from a shepherd's sling, was a Philistine. In point of walled cities, armor, and implements of warfare they excelled the Israelites.

Phillips, the name of two celebrated New England academies. The first, known as Phillips Andover Academy, was founded at Andover, Massachusetts, April 25, 1778. The original endowment consisted of 140 acres of land with buildings, some 200 acres in New Hampshire, and about $8,000 in cash. It was the gift of three brothers, Samuel, John, and William, instigated by a younger Phillips, the prospective heir of much of the property. The present endowment of the school amounts to about $400,000, with an annual income of $70,000. There are about 400 students and twenty-five instructors.

Phillips Exeter Academy, at Exeter, New Hampshire, was founded in 1781 by John Phillips, one of the same men who had taken part in the endowment of Phillips Andover. He was a wealthy merchant. His gifts amounted to $65,000. The present endowment of the institution is about $400,000, with an annual income of $100,000. There are about 300 students and sixteen instructors. Both of these celebrated academies make a specialty of preparation for New England colleges. They maintain a high standard of instruction and have large enrollments.

Phillips, David Graham (1867-1911), an American novelist whose works were very popular because of their treatment of pressing ethical and social problems. He was born at Madison, Ind., and in 1887 was graduated from Princeton University. Turning at once to journalism, Mr. Phillips was connected with papers in Cincinnati, Ohio, and in New York City. After severing his connection with the New York *Sun,* he became London correspondent of the New York *World.* He later became pri-

vate secretary to Joseph Pulitzer, owner of the *World*. Mr. Phillips retired from journalistic work after the publication of his first novel, *The Great God Success*, in 1901. This novel won him recognition as a talented story teller. His works are all entertaining, and most of them are thought-provoking. Other important works by Mr. Phillips are *The Second Generation, Old Wives for New, Her Serene Highness, The Social Secretary, The Fortune Hunter, The Worth of a Woman, The Grain of Dust* and *The Husband's Story*.

Phillips, Stephen (1867-1915), an English dramatist. In preference to studying at Oxford, he went on the stage and became a successful actor. He played several parts of widely different character and in those ways gained a knowledge of the stage both from the standpoint of actor and playwright that was afterwards of the greatest value to him. His first work, *Eremus* (1894), though praised by critics, met with so little favor that he soon withdrew it from publication. *Christ in Hades and Other Poems* (1896) was more favorably received, but Phillips' real place as a poet rests upon a small collection, *Poems* (1897), which won the Academy prize of 100 guineas. Most of his plays have been written in poetic form and the fact that there has been so little of this English drama has given them considerable popularity. Among critics, however, he is thought to be at his best in his *Poems*. Among his plays are *Paolo and Francesca* (1899), *Herod* (1900), and *Ulysses* (1902). The last was presented in the United States in 1903.

Phillips, Wendell (1811-1884), a noted American orator and abolitionist. He was born at Boston, Massachusetts, November 29, 1811, and died there February 2, 1884. He was educated at Harvard and was admitted to the bar of his native state in 1834. He opened an office in Boston but took little interest in his profession. It is said that his interest in the anti-slavery movement dated from October 31, 1835, when he saw Garrison dragged through the streets of Boston. At all events he became a prominent abolitionist. He even went so far as to withdraw from the bar, declaring that his conscience would not allow him to take the oath of fealty to a constitution that permitted human slavery. He became a noted platform orator, ranking with Everett and Webster. His style is described as being less ornate and his delivery less sonorous than theirs. He had a pleasing, easy, colloquial method of utterance that gained for him the sobriquet of the silver-tongued orator. His lectures were enlivened by flashes of wit that seemed to come spontaneously. He was a prominent member of the Anti-Slavery Society, and later took an interest in the education of the Indian. *The Irish Question, The Lost Arts, Toussaint l' Ouverture, Daniel O'Connell, Theodore Parker,* and *The Scholar in a Republic* were some of the topics that called forth his best platform efforts. The wronged and oppressed everywhere attracted his attention and called forth utterance. He was a member of the Phillips family who founded academies of that name. See ABOLITIONIST; TOUSSAINT.

Phillipsburg, N. J., an industrial city, is situated on the Delaware River opposite Easton, Pa., and on several railroads, 60 miles west of Newark. Three of the railroads that enter maintain extensive shops here. Water power developed from the river is an aid in the manufacture of furnaces, sheet iron, boilers, drills, stoves, horseshoes, foundry products and silk. It contains handsome municipal buildings and churches, a library and modern schools. In 1920 the population was 16,923.

Philology. See LANGUAGE.

Philo, Judaeus, a Jewish-Hellenic Philosopher, was born at Alexandria about 25 B. C. He had a purely theosophic idea of God, of whom he thought as a bright light, not noticed for itself, but rather for the reflection it throws on the objects about it. Philo represents man as a small world in himself, through which he stretches out for his desires, and constantly seeks for the fulfillment of all his hopes.

Philomela, fĭl-ō-mē′la, in Greek mythology, daughter of Pandion, a king of Athens. Procne, her sister, married Tereus, a Thracian king. Tereus, however, preferred Philomela. He therefore pretended that Procne was dead, having cut out her tongue that she might tell no tales, and

thus won Philomela. Procne wove the story of her wrongs into a web and thus acquainted her sister with the truth. The two women in revenge slew the child of Tereus and served him to his father at table. In punishment for so terrible a crime the gods transformed Philomela into a nightingale; Procne into a swallow. Then Tereus, who was to blame in the beginning, was changed into a hawk who should ever pursue the other two birds. See NIGHTINGALE.

Philosopher's Stone, a substance much sought by the alchemists. It was reputed to have the power to change base metals into gold and silver. So long as it appeared to men that salt, sulphur, and mercury (representing earth, air, and water), and fire were the constituents of all things visible, the search for an additional substance, which on being roasted with a base metal would make gold or silver, was not altogether foolish. Many an alchemist practiced imposture and deceit, and many an honest life was worn out in the vain quest, in attempting the impossible, to find the philosopher's stone. See ALCHEMY.

Philosophy, in a technical sense, the knowledge of the most fundamental matters. "The problems of philosophy are the problems of life, the burden and the mystery of existence, the origin and destiny of man, the relation which he sustains to the world of which he is a part, and to the unseen universe which lies about him." A history of philosophy, then, is a history of human thought concerning the first causes of things. We cannot imagine that a man ever lived through the course of an ordinary human life without speculating on the causes of his own existence and the existence of all he saw about him. So far as this speculation ceased to be the blind wonder of a child and took the form of reflection, of inquiry, of theorizing, the thinker became truly a philosopher. Thus man shows his superiority over other creatures. Even though we admit that animals reason, it cannot be denied that man alone searches for, and is able, measurably at least, to attain truth, and when he has attained it, to apply and enjoy it. To every "why" asked by the human mind it is the aim of philosophy to give a final and comprehensive answer beyond which the human mind cannot go. Philosophy then is not a branch of knowledge, it is the knowledge upon which all branches depend. It is, as it has been called, the "science of sciences."

The word philosophy, however, has many meanings beside the restricted one given above. It was used first by the Greeks, notably Socrates, and was coined from two words, meaning respectively "love" and "wisdom." Various Greek schools of philosophy adopted the word and adapted its meaning to their own peculiar views. In modern times the word is used in a broad sense to denote the general principles or theory connected with any branch of science or any form of human activity, but not forming a part of it. Thus we say the philosophy of history, meaning the relation of historical events to each other and their bearing upon man's development, which, however important, is not a part of the record of human events which is denominated properly by the word "history." So we may speak of the philosophy of language, the philosophy of fashion, the philosophy of play. In a third and very common use, philosophy designates a disposition or temper undisturbed by the ordinary vicissitudes of life. This does not or should not mean stoicism, but rather the calmness which comes of the consciousness of the ultimate unimportance of daily events as compared with the great and everlasting realities.

To return to philosophy in the restricted meaning of the word, various classifications of its problems, or departments, or disciplines as philosophers say, are possible. The modern tendency is to establish as separate sciences many branches once considered as belonging to general philosophy.

Formerly, the subject of physics was regarded as a department of philosophy and was called natural philosophy. Still more recently the department of psychology, which deals with the problem of mind, has become a distinct science. By the problem of mind is meant such questions as arise concerning the causes, conditions, and consequences of the conscious processes of the

mind. Logic, which is concerned with the problem of reason; ethics, concerned with the problem of conscience; esthetics, concerned with the problem of the sense of beauty, are treated as separate subjects. The last three, logic, ethics, and esthetics, correspond somewhat loosely to the three divisions of the mind—the intellect, the will, and the feelings—and are therefore included in a sense by the more general term psychology. Theology, which treats of the existence, the attributes, and the character of God, of the sources of our knowledge of Him and the limitations of such sources, was formerly a department of philosophy also, but is no longer so considered. With all these departments treated as distinct subjects there remain only the more abstruse disciplines: ontology, which deals with the problem and the theory of being; cosmology, dealing with theories of the universe; and epistemology, dealing with the theory of knowledge. These three are grouped frequently under the heading of metaphysics, which is, then, regarded as synonymous with the word philosophy in its narrowest sense.

In considering the history of philosophy it must be borne in mind that the various subjects mentioned above have all been, and in the broadest sense are still, departments of philosophy. The entire history of philosophy may be divided into two parts, Oriental or Hindu philosophy, and Occidental or European and American philosophy. With the latter, only, are we concerned at present. Occidental philosophy may be divided into four periods. 1. Ancient philosophy, includes the pre-Socratic period; the period of Socrates, Plato and Aristotle; and the ethical period in which appear the most celebrated schools, the Academy, the Peripatetic school, the Stoic school, and the Epicurean school. 2. Medieval philosophy is known as scholasticism and made almost wholly subservient to religion. 3. The philosophy of the Renaissance, belongs to the fifteenth and sixteenth centuries, and was characterized by the decline of scholasticism and the revival of Platonic influences. Nature began to be regarded as an object of free inquiry and psychology received more attention than heretofore. 4. Modern Philosophy begins in the seventeenth century and is associated with the name of Descartes, the founder of rationalism, the theory that from certain elementary concepts all philosophy must be deduced. Opposed to rationalism is empiricism, the doctrine that truth must be sought in experience. With this doctrine is associated the name of Francis Bacon. In 1781 Kant's *Critique of Pure Reason* attempted the arbitration of the controversy between rationalism and empiricism. Kant argued that rationalism is right in its determination of scientific method, but that empiricism is right in limiting scientific knowledge to the sphere of possible experience. Kant, called the founder of critical philosophy, marks the beginning of a new epoch in the history of philosophy. Of the philosophy following the time of Kant the idealism of Fichte, Schelling, and Hegel is the most important. Modern materialism had its beginning in France in the eighteenth century, but was almost lost sight of during the prominence of the idealistic systems of the German philosophers, to claim notice again about the middle of the nineteenth century. Materialism is that theory which claims that all facts of the universe are explained sufficiently by the assumption that matter is a reality, independent of the perceiving mind. During the nineteenth century Great Britain and Germany have produced the most distinguished philosophers. Among Englishmen the names of James Mill and John Stuart Mill are noteworthy. The latter's greatest work was in the department of logic, but his name is associated with utilitarianism, the theory that regards adaptation to an end as the criterion of real worth. The year 1860 marks the beginning of what has been called the philosophy of evolution, resulting as it has from Darwin's great discovery. The name of Herbert Spencer, author of *Synthetic Philosophy,* is to be remembered in this connection. America, while she may boast of many philosophical minds, has few names which can be mentioned as belonging in the ranks of original philosophers. Jonathan Edwards is counted as one.

Emerson is sometimes mentioned as another, but the movement known as transcendentalism was religious rather than philosophical. In recent years, the names of William James, who brought pragmatism into prominence, and of G. Stanley Hall, our foremost psychologist, are most worthy of mention.

To mention all the schools of philosophy would require a volume. In considering them it is well to bear in mind that they are not always separated from each other by hard and fast distinctions. They are named from the stand taken on some one question which has seemed vital to certain philosophers, and many of them may agree on many, if not on most, questions. Thus a classification based on the number of fundamental principles recognized, comprises the Monistic, Dualistic, and Pluralistic schools, whereas if the classification is based on the organ or instrument of knowledge most emphasized, we must speak of Rationalistic and Empiristic schools. But the empiricist may belong to the Pluralistic school or to the Monistic, when the other basis of classification is under consideration.

The definition of philosophy, that it is the science of sciences, if considered for a moment, will give a hint, at least, of the magnitude of the subject. The fact that great minds since the beginning of history have been devoted to it is sufficient testimony to its importance. It is a subject whose problems, although seemingly so abstruse and difficult, are after all "the practical questions of the day. They are the questions of everyday,—of all time."

Phipps, fĭps, **William** (1651-1695), a governor of Massachusetts. He was born at Pemaquid, now Bristol, Maine, and died in London. In his youth he learned the ship-carpenter's trade. Later he learned to read and to write and engaged in trading. He married a Boston widow of wealth, and built himself a ship in which he made successful ventures. Learning of a sunken Spanish ship off the Bahamas, reputed to contain treasure, he went to England and obtained permission to search for the wreck. A first attempt was not successful. A second, undertaken with ships and funds provided by the Duke of Albemarle, resulted in the recovery of treasure to the value of $1,500,000. Phipps' share was $80,000. He was made a knight. In 1690 the colonial authorities made him commander of a fleet of eight vessels with which he captured Port Royal. A second expedition against Quebec was without result save the loss of nine ships. Through the influence of Increase Mather, the king appointed him governor of Massachusetts. One of his early official acts, if not his first, was the organization of a special court to try witches. When accusation was brought against Lady Phipps, he appears to have lost faith in the popular delusion and to have decided upon the termination of the witchcraft trials then disgracing the colony. Charges of arbitrary conduct having been made, he went to London to clear himself, and died there.

Phlegethon, flĕj′ĕ-thŏn, or **Pyriphlegethon.** See HADES.

Phlogiston. See CHEMISTRY.

Phlox, flŏks, a favorite garden flower. The name is Greek, meaning flame. It has reference to the fine show of color made by the phlox in full bloom. The phlox is related to the gilia and to "Jacob's ladder." There are thirty species, all natives of North America. One species is found in Siberia as well, and there is possibly one other species native to Chile. Our phloxes, wild and tame, may be separated into annuals and biennials. The annuals of the garden—white, pink, salmon, purple, blue, and variegated—almost endless in variety, are descended from a wild phlox of Texas. The first specimens were taken home to London in 1835 by a collector named Drummond. The newness of the plant and the delicate wildness of the salver-shaped flowers created quite a furore among gardeners. The botanists gave the species the name of Drummond's phlox. Seeds may be sown in the open in early spring. The flowers begin to open in early summer and afford flat topped masses of exquisite color till frost cuts them down. Our perennial garden phloxes are improved varieties of the wood phloxes, the wild "Sweet William" of the eastern United States. Phlox pilosa is the characteristic phlox of the Mississippi Valley. It gives beauty to prairies from Hudson Bay to Texas and Florida. The

so-called moss pink is a matted ground phlox. Several species of dwarf phloxes grow in the Rocky Mountain region. One species spreads in mat form to the size of a bushel basket—all from a single permanent root growing in a dry rock crevice apparently incapable of sustaining life.

Phoebe, fē′bē, or **Pewee,** a familiar bird of the flycatcher family. The phoebe bird takes its name from its "humble monotones." It is a trusting, quiet bird, building its nest of moss and mud, lined with grass and long hairs, on beams or rafters about houses, barns, and bridges. The nest is repaired and occupied from year to year. Four to six white eggs are sometimes spotted

Phoebe.

with cinnamon at the larger end. The phoebe is about seven inches in length, with olivacious upper parts and whitish under parts. It may be distinguished from other birds by its black bill and a white margin half a feather in width on each side of its forked tail. It is a lively bird. It sails about the barnyard, living on insects caught dexterously on the wing. In the latitude of Iowa, the phoebes arrive from the south in April. After the nest is made ready and the eggs laid, about thirty days are required to hatch the young and enable them to fly. Some night in October the family takes flight for the Gulf States. See WOOD PEWEE.

Phoebus. See APOLLO.

Phoenicia, fē-nĭsh′a, a bit of sea coast at the eastern extremity of the Mediterranean. It lay at the foot of the Lebanon mountains. The chief cities were Tyre and Sidon. The Phoenicians appear to have been related to the Hebrews in point of language and race, but they were gross idolators. They established colonies throughout the Mediterranean region. Out of the cuneiform inscriptions of Babylonia and the hieroglyphics of Egypt they constructed the first alphabet, one of twenty-two letters. It was invented for commercial purposes—the keeping of accounts—and is the basis of our present alphabet. See TYRE; CARTHAGE; CADIZ; SOLOMON.

When history first reveals the Mediterranean, about 1600 B. C., it is dotted with the adventurous sails of the Phoenician navigators, and for centuries more they are the only real sailor folk. Half traders, half pirates, their crews crept from island to island, to barter with the natives or to sweep them off for slaves, as chance might best offer.

Farther and farther the Phoenician merchants daringly sought wealth on the sea, until they passed even the Pillars of Hercules, into the open Atlantic, and until at last we see them exchanging the precious tin of Britain, the yellow amber of the Baltic, and the slaves and ivory of West Africa, for the spices, gold, scented wood, and precious stones of India.—West.

Phoenix, or **Phenix,** fē′nĭks, in oriental tradition, a marvelous bird for a description of which we are indebted to Greek and Roman writers. Herodotus, admitting that he had never seen it except in pictures, says that in form and size it resembles the eagle and that its plumage is in color gold and crimson. According to tradition one phoenix only exists at a time. It lives, nourished on frankincense and aromatic gums, for 500 years. Then it builds a nest high in a palm tree and collects there a pile of spices and sweet-smelling gums. Upon this it deposits itself and kindles a flame by the fanning of its wings. From the ashes the bird revives, newborn and youthful, to re-live its 500 years. According to some accounts a young phoenix springs from the body of the dead bird. The young one then carries the body of its father to the temple of the sun. The phoenix is often referred to as an emblem of immortality. It is said that Sir Thomas Browne, who died in 1682, was the first

writer to express disbelief in the actual existence of the phoenix.

Phoenix, the capital of Arizona. It is important commercially, having a thriving trade in fruits, grain, hay, live stock, honey, and mining products. Many tourists are attracted there during the winter by the mild, even climate. Among the important public buildings are the capitol, the city hall, the courthouse, a public library, an agricultural experiment station, and a hospital for the insane. One of the largest government Indian schools in the country, mainly industrial, is just outside the city. The completion of the Roosevelt Dam and the wonderful impetus it has given to agriculture in the Salt River Valley will mean the continued growth and prosperity of this important city. The population in 1920 was 29,053.

Phonograph, an instrument invented in 1877, by Thomas A. Edison and since greatly improved, whereby sounds are caused to produce on a registering material permanent marks or tracings, each of which corresponds to the sound producing it and enables the sound or a sequence of sounds to be reproduced by suitable mechanism, from the register. The material now in use for recording the sounds is either a wax cylinder or a disk made of a special wax composed of stearin and paraffin, from which the familiar disk "records" of today are produced in a hardened and durable form. The material for the records used on disk machines is a composition of shellac, wood charcoal, barium sulphate, and coloring matters. The tracings for the reproduction of sound are transferred from the original record by means of a matrix.

Prior to Edison's invention, the first mechanical device for registering and reproducing speech or other sounds was called the phonautograph, constructed by Leon Scott in 1855. This was a simple contrivance, consisting of a barrel open at one end and closed at the other, from which a small tube projected, with a flexible membrane stretched across it. To this membrane, at its center, a bristle was affixed by means of sealing wax; this acted as a stylus and vibrated with the membrane. This bristle rested lightly against a horizontal cylinder, covered with paper on which was a thin layer of lampblack. When sounds entered the barrel-like body of the device, the vibrations were transmitted by the membrane to the stylus, and as the cylinder was revolved, this made a tracing on the lampblack in the form of a wavy line, which formed a record of the sound vibrations. This early device embodied the essential principles of the phonograph, but it was not until 1877 that Mr. Edison constructed a more practical machine. He substituted a receiving funnel for the barrel-shaped receiver, used an iron diaphragm for the membrane, a sharp metallic point for the bristle, and covered the cylinder with tin foil instead of lampblack. This made a great difference, for the sound vibrations were then recorded by indentations on the cylinder instead of mere surface tracings; and when the action of the machine was reversed and the stylus caused to travel over the line of indentations made by the recording point, the original sounds were reproduced by the diaphragm. Edison even then had the idea of employing a disk record, and filed patents for a disk phonograph, but disk machines were first made by others, while Mr. Edison was engaged in other researches.

In 1885 Bell and Tainter invented the graphophone, a form of phonograph using a wax cylinder in which the sound-lines were cut rather than indented. Two years later Berliner patented the gramophone, which recorded sound vibrations on a horizontal plane, or disk; and in 1888 Mr. Edison placed on the market an improved phonograph, in which the tin-foil covered cylinder had been replaced by a wax cylinder designed to be slipped on and off a central mandrel and revolved by an electric motor. He also devised separate means for recording and reproducing, and improved the efficiency of both the cutting and the reproducing stylus. A glass diaphragm was used for recording and one of mica for reproducing. From this point the development of the phonograph was rapid, and it soon became a popular device for the reproduction of human speech, song, and music of all kinds for household entertainment, besides being developed into instruments

for commercial use in dictating letters on records for subsequent reproduction on the typewriter, and for other useful purposes. See DICTAPHONE.

"Phonograph" is the general term for all machines for the reproduction of sound, though it strictly applies only to those developed by Mr. Edison and his companies. The early disk machines were termed "gramophones," but disk records have long been used on the Edison phonographs, and the use of wax cylinders is now largely confined to dictating machines and the like. All were at first called "talking machines," but this term became inapplicable when the various forms of phonograph came into general use for the reproduction of vocal and instrumental music as well as speech. Hence the trade name of the respective machines is now generally used to describe them, such for instance as the familiar "Victrola."

In the development of motive power for the phonograph, hand power, or the turning of a crank, was followed by the electric motor and then by a spring-driven motor.

Manufacture of disk records is now a great business in the United States. Any number of commercial records may be made from the original used in recording the song, speech, recitation or musical selection required to be reproduced for the public. The original, as stated, is of a special wax, and when the record is made in the laboratory, by speakers or musicians arranged around the horn of the recording instrument, it is electrotyped with copper and then with nickel to give it a durable surface. The matrix is heated and placed in the plastic material of which disk records are made, and as the material hardens quickly after the impression is taken the record is then easily removed.

The growth of the phonograph industry in the United States may be judged from the fact that whereas there were in 1889 only two establishments engaged in the manufacture of these instruments and their records, there were in 1919 about 165 establishments, employing 28,700 persons, with a capital of $105,000,000 and an annual output exceeding $158,000,000. In the five years prior to 1919 the output of the industry increased over 600 per cent.

The phonograph is now found in most American homes, as a source of amusement or instruction. It is believed to have raised the standard of musical taste, although it has also been responsible for the widespread devotion to "jazz." It furnishes music for dancing in the home, but in recent years it has been developed as an instrument of education, in teaching languages, etc., and also encourages home calisthenics by furnishing appropriate instruction and music. By the use of a series of records a whole opera may be reproduced, and the voices of great artists, public speakers, and distinguished men and women in all walks of life may now be recorded and preserved for the benefit of posterity.

Essential parts of a modern phonograph are inclosed in a wooden cabinet with a resonance box for increasing the sound, and include a sound box, mounted on a swinging arm with connecting tube, needles, levers and a clockwork motor. The horn formerly used to increase the sound has been practically discarded in favor of the wooden resonance box. Speed regulation is provided, also automatic stops, etc.

Phosphates. See PHOSPHORUS.

Phosphorescence. See PHOSPHORUS; FLUORESCENCE.

Phosphorus, fŏs′fŏr-ŭs, a slightly yellow, translucent, waxy or brittle elementary substance. The name signifies light bearing, and is appropriate because phosphorus not only gives off light but takes fire easily. In contact with the air it gives off fumes, and emits a pale "phosphorescent" light. For this reason phosphorus in the laboratory must be kept under water. The fumes of phosphorus are poisonous. Workmen in phosphorus factories and match factories are afflicted by decomposition of the bones. A small portion taken into the stomach causes death, but like many poisons, it is useful as a medicine in minute doses. Native phosphorus is not found free. Phosphorus is obtained chiefly from bone by processes of distillation, and is sent to market in sticks in tin tubes. About 6,000,000 pounds a year are prepared in England, France, and Sweden.

In the arts phosphorus is used chiefly in

the manufacture of lucifer matches. It is a useful element in the chemical laboratory. When made into a poisonous compound called phosphorus paste, it may be spread on bread and used to rid premises of rats, mice, and cockroaches.

Phosphorus in the form of a phosphate, that is, in combination with oxygen and some metal, is a necessary ingredient of productive soil. Worn out fields are lacking in either nitrogen, potash, or phosphates. Fortunately all three are present in barnyard manures. Marl charged with phosphorus is sold as a fertilizer under the general name of phosphate. Phosphates are an important element of the food of animals. They are requisite to build up animal tissue and for the nourishment of the brain and nerve centers.

The glow of phosphorus is due to slow oxidation, a quiet uniting with oxygen. Although the general name of phosphorescence has been given to this phenomenon the property of emitting a glow or light is not restricted to phosphorus. The beauty of gems, as the diamond, ruby, and sapphire, is due in part to a property of storing up light and emitting it. Common sugar has the same property. Decaying wood, known as punk, many algae, the under surface of the mushroom, the nasturtium, and the opium poppy have been observed to emit soft, delicate, more or less brilliantly colored lights readily seen in the dark.

Among animals, the jellyfish, certain centipedes, and especially the glowworm and the firefly glow fitfully in the dark. Of a quiet evening certain minute animals swarming in the sea give the wake of a ship a faint glow, intensified at times almost into a sheet of light. Even the human body has been known to glow at the moment of death. Formerly these cases of phosphorescence were supposed to be due to the presence of phosphorus, but scientists have reached a point where they are ready to declare that the glow may and does take place where there is no trace of phosphorus. In the case of animals, investigators are inclined to link phosphorescence with electricity, generated like movement by the vital forces of the body.

In case of minerals, phosphorescence is attributed to a structure that causes wave motion to change its frequency and reappear in some other form or color. The glow of punk wood, it is suggested, is due to the presence of phosphorescent bacteria.

See MATCHES.

Photography, fō-tŏg′ra-fy, the art of taking pictures by means of light. It is hard to say when the effect of light on color became a subject of study. In the eighteenth century Scheele, a Swedish chemist in the University of Upsala, found that the violet rays of the solar spectrum darken silver chloride. In 1839 Daguerre, a Paris scene painter, published a method of taking pictures. His process consisted in coating a silver plate with iodide, then exposing it in a camera. The different degrees of light proceeding from the light and dark places of the object produced corresponding differences on the iodide of the plate. This difference was brought out and fixed by a subsequent bath in vapor mercury, the mercury adhering to the several parts of the plate in proportion to the extent to which it had been affected by light. This sort of picture was named a daguerreotype in honor of the inventor. The first sun-lit picture of a human face was taken by Professor John Draper of the University of New York. In 1840 he took a daguerreotype of his sister Dorothy. It is still in existence in the family of William Herschell of England, to whom it was sent as a scientific curiosity. Daguerreotypes were expensive. They required a long, tedious sitting, and then only one picture could be produced. An account of the various substitutes for silver and iodine and the improvements which enable a photographer to produce an unlimited number of photographs from one plate are too technical for our purposes.

A method of instantaneous photography has been developed, so short a time exposure—a mere fraction of a second—that it is practicable to obtain a clear picture of objects in motion, as a moving train or a trotting horse. In 1888 George Eastman, of Rochester, New York, devised a miniature hand camera which he named the kodak. It contains a reel of sensitive paper on which many impressions may be taken to be developed later. The manufacture of kodaks has risen to commercial importance.

Photography has acquired an importance among scientists. Descriptions may err or fail to carry an intended meaning. Sunlight records facts or, at least, appearances. In legal affairs a photograph is accepted as the best of evidence. The astronomer uses the camera. During an eclipse the observer busies himself taking a series of photographs to be studied at leisure. Astronomers are employed busily photographing the heavens as a record of the present position of the stars. A score of telescopic cameras are at this work in various parts of the world. Naturalists are taking photographs of lions in Africa, elephants in their native jungles, and of bird, beast, and fish everywhere. The hunter with camera, instead of rifle, creeps up or lies in wait. If in darkness, he uses a flashlight—a moment of exposure—and he has his picture faithful to life. To obtain a photograph of a bird on her nest the naturalist resorts to the device of setting the camera in position. He then retires to a place of concealment at a distance, and at the right moment exposes by pulling a long cord. Cameras, and indeed, series of cameras, are sent aloft by means of a kite and are operated by a cord to obtain views of the horizon, of fortifications, and bird's-eye views of cities and landscapes. A tiny self-acting camera strapped to the breast of a pigeon has been sent aloft. It has been suggested that pigeons be trained to spy on the movements of armies in the field.

Not least among the services of the photograph is its use in education and in art. At a cost of a few cents each it is now possible to bring pictures into the schoolroom and to decorate the home with photographic reproductions that are excellent from an artistic point of view. Although persons are yet living who can remember the interest aroused by the first daguerreotype, the business of manufacturing photographers' supplies has risen in the United States to the status of an important and valuable industry.

Photography, Color, the reproduction by photography alone of the colors of nature. The photographic processes in ordinary use reproduce the image in varying shades of gray, but without accompanying natural colors. Though the problem is still not satisfactorily solved, two wholly different methods of procedure have been resorted to with a fair degree of success. One is the Lippman, or "interference" process, which depends for its effect on the decomposition of light, and is based on the fact that the colors seen by the eye are caused by ether-waves with differing wave number. A photographic plate of fine grain is backed by a layer of mercury, which acts as a mirror, and as the waves enter the mercury they are reflected and form stationary vibrations. The light reflected back on itself enters and makes its exit with the same degree of velocity, and, because of the interference, propagation stops, and the waves are stationary, each rising and falling in its own place. To see a film which has been exposed in this manner in its proper color effect it must be viewed by reflected light, the colors reflected being dependent on the way in which different parts of the surface have been impressed by light waves.

The other method is popularly described as the three-color process. Prof. J. Clark Maxwell, of the University of Cambridge, showed in 1861 that by producing three simultaneous color sensations, certain shades of blue, green, and red—and by proper adjustment of the intensities of these, any color of the spectrum could be obtained. This was applied to photographic plates, three photographs of the object were taken, each through a colored screen, allowing varying amounts of the three colors to pass. From this general idea three different processes have been worked out. The one known as the Ives process makes use of the three plates and the three screens. From the negatives three positive transparencies are made in monotone. They are then placed in a viewing instrument known as the "kromskop," each with its screen of red, green, and blue. As these are combined, seen apparently as superimposed on one another as the sunlight enters, the original colors of nature are obtained. Professor Joly of Dublin and Mr. McDonough of Chicago improved on this method, each working independently, and made use of a composite screen requiring only one photograph. Other methods known as those of Lumière, Wood, and Sanger-Shepherd, have

been used successfully. Within more recent years more attention has been paid to successful printing of the natural colors of the photograph of any colored object. Prof. A. B. Leckenby uses the old system of photography up to the making of the print, and varies his method when it comes to the emulsion of the sensitive paper.

Photogravure, or **Photo-Engraving,** a process by which, through the action of light and chemicals on sensitive surfaces, plates are obtained on which facsimiles of drawings and photographs can be converted into engravings. It has taken the place of wood and steel engraving in most printing establishments. A metal plate is coated with a thin layer of asphaltum, and over this is placed a glass on which the photograph to be engraved has been reproduced. Exposed to light the coated surface becomes insoluble, while that portion of the picture plate which is protected by the dense parts remains soluble. The whole plate is then washed with a solvent and the hardened asphaltum parts which remain are chemically etched. The art of photogravure has already been carried to such an extent that it gives better satisfaction for finish and delicacy than any method of steel engraving known. Reproductions of colored originals have been made with partial success, but much remains yet to be done before the art is perfected. Many of the methods used are results of individual experimenting and are kept secret.

Photom'etry, the measuring of the intensity of light. Instruments for this purpose are called photometers. A simple method suggested by Rumford is by a comparison of the shadows cast. The lights to be compared are moved back and forth in front of a screen with a vertical rod before it, till the shadows of the rod cast by the two sources are equal in intensity. As the intensity of the illumination varies inversely as the distance from the source of light, a simple calculation will give the relation between the lights tested. If the candle power of a lamp is to be determined, one of the lights must be a standard candle. The chemist Bunsen devised a photometer consisting essentially of a grease spot on a piece of parchment, illuminated from each side by one of the lamps. The side lighted by the stronger lamp will be the darker. Move the screen with grease spot till equally illuminated and calculate the result as with the Rumford method. See CANDLE.

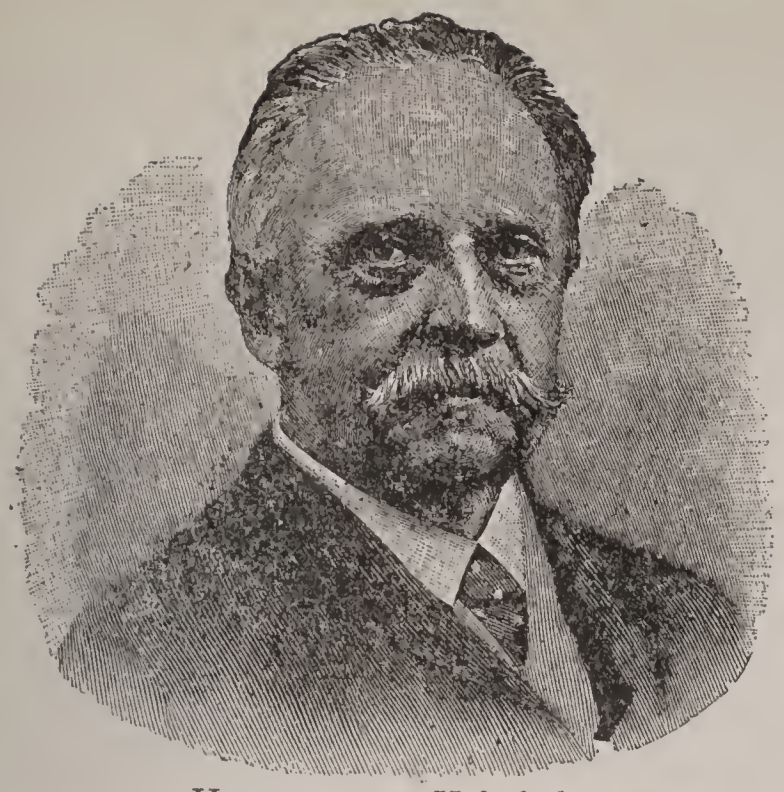
Phrenology, a system of correlation of the faculties of the mind with particular regions of the brain, which regions are supposed to show large development or the reverse, by the corresponding conformation of the skull. Phrenology is based on the erroneous hypothesis that the brain conforms exactly to the shape of the skull.

This system was formulated first in 1796 by Francis Joseph Gall, a Viennese physician, who enumerated about thirty faculties of the human mind. Others, of whom Spurzheim and Combe were most noteworthy, adopted Gall's theories, and various systems and charts showing the supposed location of the faculties were produced and became popular. During the middle of the nineteenth century it was quite the common thing for a phrenologist to travel through the country lecturing and making public examinations of heads. Usually a chart or book would be offered for sale also. For one dollar this would-be man of science would make a complete examination of a head, marking the chart plainly according to the results, so that the victim might know all his talents and intellectual gifts, what walk in life he should choose, what faculties he should cultivate and what sort of a person he should marry. Phrenology, although absurd to the modern scientist, served a useful purpose in stimulating more thorough study of the human brain.

Phylloxera. See GRAPE.

Physical Training. See ATHLETICS; JIU-JITSU.

Physics, the science which treats of the laws and properties of matter and the forces acting upon it. It is the fundamental one of that group of sciences known as physical, which includes also astronomy, chemistry, geology, and others, as distinguished from the natural sciences, which deal with life, such as botany, zoölogy, physiology, etc. Some years ago the term natural philosophy was inappropriately used for what is now included under physics. The only one of the physical sci-



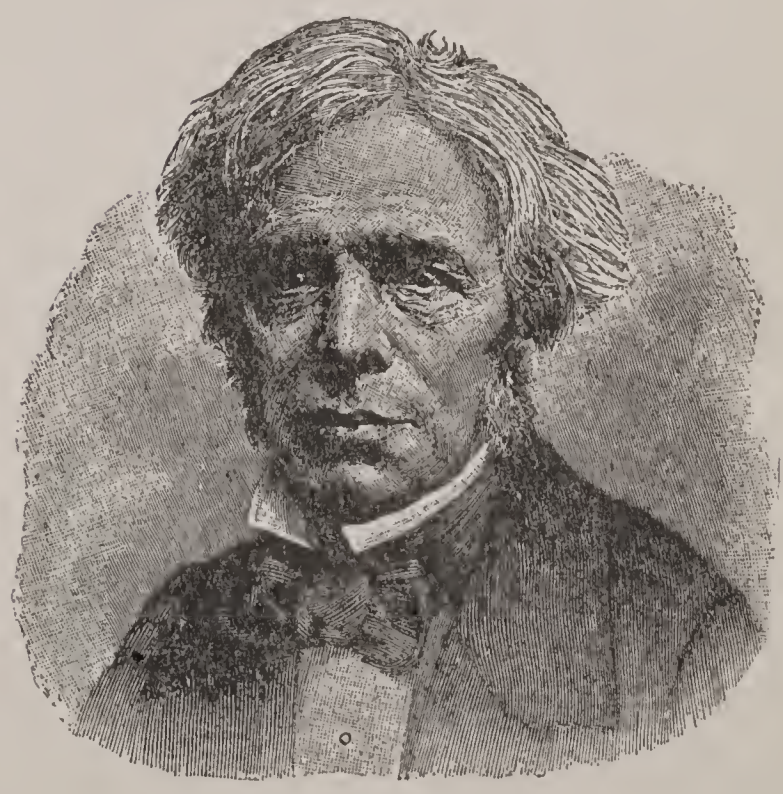
Hermann von Helmholtz.

André Marie Ampère.

Gustav Robert Kirchhoff-

Allesandro Graf Volta.

Wilhelm Konrad Roentgen



Michael Faraday.

NOTED SCIENTISTS IN PHYSICS.

ences so closely related to physics as to need distinction is chemistry. Both deal with matter and energy; but chemistry is the physics of the molecule, having to do with the elements which by their combination form molecules. Physics on the other hand confines itself to such changes only as do not involve a change in the composition of matter. The energy transformations accompanying chemical changes could most properly belong to the realm of physics. There is a broad region where these two sciences overlap, as is seen in the common terms physical chemistry and chemical physics.

Physics, as the science of energy, rests upon the fundamental modern doctrine of the conservation of energy. Before the enumeration of this principle by Maxwell, physics consisted of groups of facts loosely related and based upon a number of mere hypotheses. Now all are tested by this touchstone and unified with "the one generalized statement which is to be found consistent with fact, not in one physical science only, but in all". As ordinarily taught physics is made up of the apparently unrelated sciences of mechanics, sound, heat, light, electricity, and magnetism. The first three are sometimes classed as the physics of matter, the last three as the physics of ether. Under the former, mechanics and sound might be called mass physics; and heat, molecular physics.

See MECHANICS; SOUND; HEAT; LIGHT; ELECTRICITY; MAGNETISM, etc.

Physiography, a term used in the United States for the branch of science which describes and explains the physical features of the earth's surface. The exact scope of the word is not agreed upon, some making it synonymous with physical geography, others making it an all-inclusive term embracing meteorology, oceanography, mineralogy, etc., while still others limit it to what is but a part of physical geography, the mere description of the solid surface of the earth. It is closely related to geology, for present forms can be explained only from the past history of the earth. It includes such part of meteorology as is necessary to explain physical features as determined by air, winds, and precipitation. The effects of waves and currents, under oceanography, also belong to physiography. As commonly presented it is a distinctly general science, overlapping several but leaving minute details to the special branches. See CURRENTS; TIDES; WAVE; WIND; CLIMATE; DESERT; EARTHQUAKE; GEOLOGY; ICE AGE.

Physiology, the branch of natural science which treats of the functions of living forms and of their life activities. That part dealing with the human body is included in most school curriculums. Elementary text-books on the subject usually include some matter on anatomy and a more or less extended treatment of hygiene. Physiology proper deals chiefly with the subject of the nutrition of a body itself and the relation of that body to the world through the nervous system. Nutrition includes circulation, respiration, and digestion, with all their steps and details, while a study of the nervous system may include the special senses, the muscles, and the protective parts of the body. Knowledge of the functions of a healthy body is necessary to a recognition of its condition if diseased. Physiology is a connecting link between biology and the strictly medical branches. See SKELETON; CIRCULATION; BRAIN, etc.

Piano, pē-a′nō, a stringed musical instrument. The strings are steel wires of various lengths and weights, extended over bridges above a sounding board. Additional weight is produced by wrapping the steel wire with a single or double coil of brass wire. In play the wires are struck by small felted hammers operated by means of keys. The sound of the wire may be deadened immediately by the use of soft dampers brought in contact with the string. Pedals operated by the foot are used to produce louder or softer tones. For the sake of stiffness, the frame on which the wires of the piano are strung is made of iron. It requires to withstand a stress without bending of from twelve to thirty tons.

There are three kinds of piano. In the grand pianoforte the strings lie parallel to the keys. In the square they lie horizontally at right angles to the keys, and in the upright piano the strings are stretched in a vertical direction, also at right angles to the keys. The name pianoforte is a compound of two Italian words, meaning soft

and loud. Historically, the piano is a development of the harpsichord, the notes of which were of uniform intensity. The player of the harpsichord had no control over the loudness or softness of the notes.

The credit of inventing the hammer action of the piano is given to Cristofori of the city of Padua, dating about 1711. He was a maker of harpsichords in the employ of the Duke of Tuscany. Primitive pianos were exhibited in Paris and in Germany soon after. The first piano ever brought to the United States was imported by John Jacob Astor in 1784. So far as known the first American piano was built in Philadelphia in 1775. New York is the leading American center for the manufacture of pianos. Boston and Chicago are also important centers. Factories for the manufacture of pianos are, however, widely distributed over the United States. In 1921 there were 185 of these manufactories in the country, giving employment to 17,883 persons. The value of the entire output of pianos for the year was $73,647,000. In the records of the patent office, the names of Steinway, Knabe, Lyon & Healy, Vose & Sons, Fischer, Baldwin, Mason & Hamlin, etc., are of freuent occurrence.

Before the World War, Germany was the great center of the world for the manufacture of pianos. The disorganization brought about by the war, however, detrimentally affected this, as well as all the other industries of Germany.

Piano Player, an instrument designed for automatic piano playing. Hammers, or "pneumatic fingers" are placed opposite each key, and these hammers are operated by air pressure produced by bellows or pedals which are controlled by the feet of the performer. A sheet of paper, perforated to correspond to the music that is to be reproduced, is placed in a roll and as air is admitted through the perforations the suction produced sets the hammers in motion and they strike the keys. By means of other mechanical devices the instrument has been perfected until the speed of the music, as well as its intensity and duration, can be regulated. Despite these additional levers which control expression, the mechanical element always predominates in the music. Pianola is another term often used.

Picayune, pĭk′ā-ūn′, a name used in Louisiana for a coin worth six and one-fourth cents. Originally a word derived from the Carib language, it has grown to be used in the southern states as a slang term. Before 1857, when foreign coinage was withdrawn from circulation, it was current throughout the United States under various names. In New England it was called a ha'penny or fourpence; in Pennsylvania and Virginia, a fip, and in New York it passed under the name of sixpence. The meaning of the expression "not worth a picayune" is self-evident.

Pickerel. See PIKE.

Pickett, George Edward (1825-1875), an American soldier. He was born at Richmond, Virginia, and educated at West Point, graduating in 1846. During the Mexican War he rendered gallant service, and in 1856 when he was serving in the territory of Washington, prevented the landing of British troops on San Juan Island. In 1861 he joined the Confederate army as major of artillery, a year later becoming major-general. He was an important help to Lee at Fredericksburg, but his most noted service was at Gettysburg. There, on the 3rd of July, he led 5,000 men in a magnificent charge against the Federals on Cemetery Ridge. Though when 300 yards from the enemy he met a musketry fire that turned back the advance at his left and his right, Pickett led his men straight up to the Federal line. A hand to hand struggle followed, and Pickett's men beat back the opposing troops; but not for long. Fresh forces rushed up from the Union lines, and the remnant of Pickett's command retreated with an appalling loss of dead and wounded. The charge of his division is considered one of the finest in history. After Gettysburg, Pickett was commander of the Department of North Carolina, defended Petersburg in 1864, and was engaged in several battles in the closing year of the war, among them Dinwiddie Court House and Five Forks. He lived in Richmond until his death.

Pickles. See PRESERVES.

Picts, a Celtic people of northeastern Scotland. Little is known of their origin, history, or fate. An amusing discussion of the first question is carried on by Jona-

than Oldbuck and Sir Arthur Wardour in the sixth chapter of Scott's *Antiquary*. The earthhouses of northern Scotland are supposed to be their ancient habitation. Their territory extended from the Firth of Forth to the Pentland Firth. Tradition and the records of monks have preserved a list of sovereigns. They were converted to Christianity about 563. As to their disappearance from history they were doubtless absorbed by the Scots. Without doubt the modern Highlanders are in part the descendants of the Picts.

See SCOTLAND.

Picts' Houses. See EARTHHOUSE.

Pictured Rocks, a series of sandstone cliffs on the southern shore of Lake Superior. They are about 300 feet in height and five miles in length. They are situated forty miles east of Marquette, Michigan. Sculptured rocks would be a more expressive term. The cliffs have been weathered into caves and fantastic forms by winds, frosts, and waterfalls. The rocks are of various colors, including red and yellow. In Longfellow's *Hiawatha,* the wigwam of Nokomis is located among the pictured rocks.

Pictures. See PAINTING.

Pickwick Papers, a story by Charles Dickens. It was published in serial form during 1836-37. The full title is *The Posthumous Papers of the Pickwick Club,* and the hero is Mr. Samuel Pickwick, founder of the Pickwick Club. This was in reality Dickens' first attempt at writing a work of any length; the preceding volume, *Sketches by Boz,* being, as the title indicates, a collection of brief sketches, published originally in a London newspaper.

The *Pickwick Papers,* which had an enormous commercial success, commences also an era in English literature. It was the first of a series of fictitious works exhibiting the life and manners of the middle and lower classes which up to that time had had scarcely any exponent. In one respect, however, this book had neither predecessor nor progeny. Neither before nor since has there ever been such an embodiment of healthy animal spirits. There is none like it for unflagging but never unwise merriment—for humour that is very much the reverse of dry. That Mr. Dickens gave us no more *Pickwick Papers* is to be lamented, but may be easily explained by the fact, that he never had the advantage of being five-and-twenty again.—*Chambers's Encyclopedia.*

Piedmont, pēd′mŏnt, a region of northwestern Italy, lying at the southern foot of the Alps. Its chief city is Turin. It is drained by the head waters of the Po. It was formerly a part of the kingdom of Sardinia. The name is French, from *Piedmont,* meaning foot of the mountain. The name is general and is applied to similar physical regions elsewhere. The Piedmont region of the United States lies along the southeastern foot of the Appalachian Mountains. It extends from Georgia northward. It is marked throughout its length by a series of waterfalls.

Pied Piper of Hamelin, The, a magician of medieval legend. The town of Hamelin was infested with rats. For a certain sum of money the piper agreed to rid the town of the pests. He played on his pipe and the rats all followed him to the river and were drowned. Then the citizens, thinking themselves safe now the rats were gone, refused to pay the price agreed upon. The piper took his pipe again and this time the children of the town followed him. On they went out of the town to a hill which opened, received them, and closed again. The children were gone forever. Browning's poem, *The Pied Piper of Hamelin,* published in 1842, is based on this story.

Pie Plant. See RHUBARB.

Pierce, Franklin, the fourteenth president of the United States. He was born in Hillsboro, New Hampshire, November 23, 1804. His father was a general in the War of the American Independence and later became governor of New Hampshire. Young Franklin was educated at Bowdoin, Maine. Nathaniel Hawthorne was a student at the same time. A friendship formed between the young men continued through life. After graduation Pierce taught school, studied law, and settled down to practice in the town of his birth. He was a man of good appearance and address and a pleasing public speaker. In politics he was an ardent follower of Andrew Jackson. At twenty-five years of age he was elected to the legislature of his own state. In 1833 he was sent to Congress. Four years later he was elected United States senator. During the Mexican War he served as brigadier-general. His views on the slavery question being satisfactory to the Southern wing

of the Democracy, he was nominated and elected president in 1852. On the occasion of his inaugural, a platform of New Hampshire pine was erected over the steps of the eastern portico of the federal capitol. He took the oath of office in a blinding storm of sleet. His cabinet was wisely chosen and served without change during his entire term. Among the events of his administration were the Gadsden Purchase, the Ostend Manifesto, the settlement of the boundary with Mexico, the beginning of commercial relations with Japan, and the passage of the Kansas-Nebraska Bill. So far as appointing a governor and other official acts were concerned Pierce aided the pro-slavery element in the Kansas struggle. In fact he sent a special message to Congress declaring the formation of an anti-slavery government in Kansas an act of rebellion. His attitude in this matter cut off his Northern support. He was not renominated for the presidency. At the outbreak of the Civil War he supported the national government. While the historian does not accord Pierce a leading position among the presidents of the United States, he is regarded as a man of fair ability, of integrity, and of kind feeling. He died at Concord, New Hampshire, October 8, 1869. See HAWTHORNE.

Pierre, S. D., the capital of the state and the county seat of Hughes County, is on the Missouri River and on the Chicago & Northwestern Railroad, in the geographical center of the state, and the approximate center of the North American continent. The city is on the famous Black and Yellow Trail, in the center of a vast agricultural region, and is a live stock market of importance. It is also an important wholesale and retail center, and has one of the finest saddleries in the West.

The most notable building is the capitol, which was erected at a cost of $1,000,000. Other handsome structures are the Federal building, Carnegie library, public schools, high school, Industrial School for Indians (Federal), St. Mary's Hospital, U. S. land office and state library. One of the finest steel railroad bridges of the Northwest spans the Missouri at this point. In 1920 the government census showed Pierre to have a population of 3,209.

Piers Plowman, or **Vision of Piers Plowman,** an old Saxon alliterative, unrhymed poem of the fourteenth century. There are forty-five extant manuscripts of the poem, and at least three distinct versions, known respectively as the A, B, and C texts. It is written in the form of an allegory. To Piers, the plowman, a dreamer, comes a vision of the world, "a fair field full of folk," and into this motley assembly intrude the evil influences of the Seven Deadly Sins. Dean Milman writes thus of the author: "The sad, serious Satirist in his contemplation of the world around him, the wealth of the world, and the woe, sees no hope but in a new order of things in which, if the hierarchy shall subsist, it shall subsist in a form, with powers, in a spirit totally opposite to that which now rules mankind." The author, though no radical reformer, hates bitterly the wrong and is sincere in his pleas for right and moral equity. It is a poem of the age and expresses public opinion, and as such it becomes an interesting sociological study of the time depicted. Further, its religious element is strong, and his pleas for adhering to simple Scriptural truths rather than building on polemics and speculative theology, occupy a large portion of the poem. It is a work of literary merit, and the writer of the A text is clearly a man possessed of a keen visualizing power.

Pig. See HOG.

Pigeon, pĭj′ŭn, a general name given to any species of the dove family. The distinction between pigeons and doves is one of name merely. There are several hundred species. The order includes the extinct dodo of Mauritius and a pigeon as large as a hen turkey still found in New Guinea. Cuvier classed the pigeons and doves with the grouse, which indeed they resemble. There are a number of differences, however. The pigeons are swift, graceful, easy flyers. The toes are on the same level; they drink until satisfied without raising the bill; two and two they mate for life; the male assists in building the nest and in keeping the eggs warm; the female lays but two eggs for a sitting; the young are without feathers and are helpless —"mere squabs."

Our domestic pigeons or doves are de-

rived from the rock pigeon of the Old World. This wild pigeon is uniformly twelve inches in length. Its prevailing color is bluish. It nests in the rocks and caverns of Great Britain, especially in the Orkneys and Hebrides. It is found also in great numbers on the rocky islets of the Mediterranean and as far east as Japan. Its domesticated descendants, however, exhibit a remarkable diversity of color and size—white, bronze, blue, gray, and even black, in every imaginable combination and marking, while in size there is an equal degree of variation. The fan pigeon has an immense fan-like tail which it displays with a proud strut. The tumbler has a way of turning or tumbling in its flight. The monk has a feathered head; the pouter inflates its crop till its head seems insignificant. Fortunes have been spent by pigeon fanciers in breeding fancy types. By Scottish law, no person is permitted to erect a dovecot unless he holds lands sufficient to afford reasonable feeding ground. One who breaks into a dovecot is held at the level of a chicken thief.

The domestic pigeon begins to breed at nine months and produces a pair of young every month unless interrupted, as in the north, by severe winter. The hairless young are called squabs. They are fed by regurgitation, that is, the old bird raises milky food from her stomach with which to feed her young. The business of raising squabs for market is extensive.

The characteristic native species of America is the passenger pigeon, once numerous but now almost extinct. This wild pigeon is about sixteen inches in length, with bluish slate-colored upper parts, and light brown or white parts beneath. A flock seen from above flashes with a blue metallic lustre in the rays of the sun. Seen from beneath as the birds pass overhead, there is a beautiful commingling of blues, wine color, and white. In the days of Audubon and Wilson, and until recently, the pigeon was accustomed to migrate, feed, roost, and nest in colonies. Wilson describes a flock observed, 1808, near Frankfort, Kentucky, which he estimated to contain 2,220,272,000 birds, and which he further calculated would need to devour 17,424,000 bushels of beech nuts per day.

This seems incredible, but a flock is recorded as roosting in Michigan as late as 1876 which occupied a strip of forest twenty-eight miles long and three miles wide. At daybreak columns of pigeons numbering thousands poured out of the roost and winged their way with inconceivable rapidity to feeding grounds hundreds of miles away in every direction. At nightfall the detachments came pouring in to the roost with a roar of wings like a tornado, which at a distance of a few miles was softened like the noise of a waterfall. They settled on the limbs of the trees in such numbers that the overloaded branches not infrequently broke with the weight. Such was the confusion and crowding that the camp was not quiet until far into the night. The present writer visited a temporary encampment of pigeons in a forest on the banks of the Minnesota in 1875. The birds thronged the trees covering possibly five acres of woodland.

In earlier days these spring encampments were expected as regularly as the running of fish in the streams or the migration of wild ducks. From Minnesota to Kentucky night raids with torches, lanterns, guns, long poles, and bags were made on the crowded roosts. The birds were so confused and dazed by the glare of the lights that they could be swept from the lower limbs like chickens from a perch. People drove a day's journey to have their part in the nightly slaughter, and literally wagon loads were carted off for market or to be thrown to the hogs. Under such persecutions, and the destruction of their nesting places by clearings, countless millions of birds have been reduced to small bands or scattered pairs that no longer attract attention. It is believed that a few pairs, or very small flocks, are still alive, and the American Ornithologists' Union has offered a series of rewards for the person finding and reporting such nests without disturbing birds or eggs. Leaflets have been prepared, describing and picturing the birds, giving their nesting habits and other information, for their identification, and giving a list of the rewards offered and the conditions of winning them. The sums to be distributed already amount to some $3,000. Mr. Charles K. Reed, Worcester, Massa-

chusetts, will send these lists and information upon receipt of six cents in stamps to pay postage.

An exceedingly interesting feature of bird life has passed, but such flights were to be dreaded by the settlers. A flock of pigeons, numbering anywhere from a few dozen to a million was likely to swoop down on a newly planted clearing, and devastate it. The movement of a feeding band was peculiar. In the open the flock flew noiselessly. The front birds dropped at the first sight of food, the others settling beyond them in regular order, the last birds settling farthest to the front. By the time the last birds were feeding the first to settle followed them to the front flying above the feeding flock. The rear birds in this fashion were constantly flying to the front and the entire flock seemed to revolve like a cylinder, or roll like a lady's muff from one side of a field to the other, when the whole flock bounded into the air to seek food elsewhere. From a bird lover's point of view this swiftly rolling flock was a brilliant scene, but the heart of the settler sank when he saw his seed grain devoured by these handsome, hungry, agile, and audacious possessors of quick eye, foot, and wing. Nor was it easy to defend a field. Even though an entire family was out firing shotguns and beating tin pans, gusts of birds would sweep in and off again. The present writer has seen acres of seed wheat snatched from the soil under the very muzzle of his shotgun or under any other precautions devised.

The corresponding species of the Rocky Mountains and Pacific coast is the band-tailed pigeon. It is marked by a conspicuous white collar and a square tail ending in a two-inch band of dull white. The head is purplish; the under parts are a fading pink. The prevailing color of the upper parts is a grayish blue.

See DARWIN; DOVE; CARRIER PIGEON; DODO; PHOTOGRAPHY.

A hundred wings are dropt as soft as one,
Now ye are lighted—lovely to my sight
The fearful circle of your gentle flight,
Rapid and mute, and drawing homeward soon;
And then the sober chiding of your tone
As there ye sit from your own roof arraigning
My trespass on your haunts, so boldly done,
Sounds like a solemn and a just complaining!

—Charles Tennyson Turner.

Pigment. See PAINT.

Pigweed, a common weed called also careless weed and rough amaranth. This is the plant described as pigweed in the reports of the department of agriculture. The common goosefoot, of a different genus, is known as the white pigweed. Both varieties are found everywhere. The first-named plant is a coarse annual, bearing tiny green flowers in a spike. The leaves are rough and somewhat hairy, long-petioled, ovate, and of a dull green color. It flowers from July to October, and bears seeds from August to November. Mowing before it is ripe, and thorough cultivation of the soil will keep it in check. The seed is found in all grains, the plant in all cultivated places. The goosefoot, or white pigweed, is also an annual with a white, somewhat mealy stalk. The sessile flowers grow in small clusters which are collected in spiked panicles. The leaves, from whose shape the plant was named, are from ovate to linear, and more or less notched or toothed, especially the lower ones.

Pike, Zebulon Montgomery (1779-1813), an American soldier and explorer, for whom Pike's Peak was named. The son of an army officer, he entered his father's regiment when only fifteen, and in six years was made a first lieutenant. The Louisiana Purchase was the cause of his being sent, in 1805, to trace the course of the upper Mississippi. After an adventuresome nine months' voyage he reached Cass Lake in northern Minnesota. A second dangerous commission was given him upon his return,—that of leading a party through the heart of the Louisiana Purchase. He went up the Missouri and Osage into what is now Kansas, then turned south to the Arkansas River, and ascended it as far as the site of Pueblo, Colorado, from which spot he could see Pike's Peak. He began a search for the Red River, but encroached on Spanish territory and was arrested with his party; soon afterward he was escorted to the boundary and released. Upon his return he was promoted rapidly, being nominated for brigadier-general at the time of his death. While storming a fort at York, now Toronto, Canada, he was killed by a rock from an exploded magazine.

Pike, or **Pickerel,** a family of voracious fishes. The body of a pike is long and almost cylindrical, with a long, flat snout fitted with teeth worthy of a shark. Jordan says there are five species: the American pickerel, dark green, in coastwise streams, length twelve inches, Massachusetts to Florida; the little pickerel, length twelve inches, olive green, sides marked with dark curved stripes like worm tracks, found in the small streams and bayous of the Mississippi; the eastern pickerel, green, with a network of side markings, length thirty inches, Maine to Alaska, not west of the Alleghanies,—the kind that Whittier failed to land; the pike, northern pike, or northern pickerel, grayish with whitish round spots, length thirty to fifty inches, found in Europe, Asia, and North America from Lake Champlain to Alaska; and largest of all, the muskallunge, dark gray with round blackish spots, length up to eight feet. It is a magnificent fish and is found in the Great Lake region and northwestward. The wall-eyed pike, so-called, is more nearly a bass. Pickerel or pike are not favorite kinds of fish. Although the flesh of cold water pickerel is firm and white there is more or less prejudice against it. The indictment contains a long list of charges. It is the most voracious fish in our waters. It exterminates other fish and eats anything with the least appearance of life. In Europe it is considered a meaner trick to put pike in a gentleman's fish pond than to turn a horse loose in the kitchen garden. Thoreau had an eye to the picturesque qualities:

> The pike is a solemn, stately, ruminant fish, lurking under the shadow of a lily-pad at noon, with still, circumspect, voracious eye, motionless as a jewel set in water, or moving slowly along to take up its position; darting from time to time at such unlucky fish or frog or insect as comes within its range, and swallowing it at a gulp. Sometimes a striped snake, bound for greener meadows across the stream, ends its undulatory progress in the same receptacle.

Pike's Peak. See COLORADO.

Pilate, Pontius, the Roman governor of Judaea, Samaria, and Idumaea at the time of the crucifixion of Christ. Pilate's official title was procurator; his authority as judge was absolute, except in the case of Roman citizens who might appeal to Caesar. He delegated much of his judicial power to local courts, such as the Sanhedrin; but none of these could execute a death sentence before it was confirmed by him. That is why after Christ's condemnation by the Sanhedrin "the whole company of them rose up and brought him before Pilate." We despise Pilate's weak-kneed yielding to them, but it is of a piece with all his other actions as a governor. He was a harsh, cruel man who lost no chance to thwart and humiliate his subjects. He robbed the treasury of the temple to pay for an aqueduct; he murdered whole companies of his people at their worship. In 36 A. D., after ten years of such cruelty, he was recalled from office. He is said to have been banished to Gaul where he committed suicide. There is another story to the effect that his body was thrown into the Tiber, and there caused fearful floods and tempests.

Pile Fabrics, a name given to a class of textiles woven with a face covering consisting of threads set closely together and standing up in the form of loops or thread ends. Pile fabrics may be divided into two classes, those in which the pile is formed by an extra series of warp threads, and those in which it is produced by an extra series of weft threads. To the first class belong velvet, plush, astrakhan cloth, Brussels and tapestry carpets, and terry cloth. To the second class belong velveteen, corduroy, and fustian. See PLUSH; VELVET; VELVETEEN; CARPET; ASTRAKHAN.

Pilgrims, a body of English Separatists. With the exception of a leader or two and their pastor who had been educated for the ministry, they were simple, industrious villagers. They lived chiefly in Scrooby and Austerfield in Nottinghamshire, not very far from Epworth, the home of the Wesleys, the source, in a way, at a later time of Methodism. These peasants refused to attend the services of the Church of England. They held secret meetings in their homes, an act strictly forbidden by King James and the authorities of the English Church. They were arrested, thrown into prison, fined, and harassed to such an extent that they made their way in 1607 by common agreement to Holland. In 1608 they were gathered at Amsterdam.

The next year they migrated to Leyden. Frequent removals and sojourn in a strange land led Bradford, their historian, to call them Pilgrims. At Leyden they found employment as weavers, gardeners, twine spinners, stocking weavers, as carpenters and masons, as makers of pipes, clocks, and hats, and as bakers, coopers, and tailors. They were law-abiding people of small means. They lived at Leyden eleven years. They were much dissatisfied with their home. They were obliged to labor long hours to obtain bare food and clothing. They feared that their young people would learn the Dutch language, marry into Dutch families, and that their church would become extinct.

In 1620 the leaders resolved to migrate to the New World beyond the Atlantic of which they had heard. Arrangement was made with English merchants, whereby the latter agreed to advance money in return for services and future shipments of furs. A considerable portion of the church, including the aged pastor, John Robinson, and all who were considered too feeble to cross the Atlantic remained behind. The others crossed over to England and set out from Southampton in two ships, the Speedwell and the Mayflower. The Speedwell was reported unseaworthy. Both ships put back to the port of Plymouth. It was learned afterward that the crew of the Speedwell was desirous simply to avoid the hazard of the long voyage. September 6, 1620, the Mayflower set sail again, with forty-one passengers, their families, and fifteen male servants, in all 102 persons. Arrangements had been made for the colony to settle near the mouth of the Hudson, but, after a stormy passage of sixty-three days, the captain of the ship for some reason carried it far to the northward, coming to anchor in the harbor of Provincetown near Cape Cod.

While the ship was still rocking in the harbor the forty-one men met in the cabin of the Mayflower and drew up and signed an agreement promising "In the presence of God and of one another. . . all due submission and obedience" to such laws as they might find it necessary to enact. This document is known in history as "The Mayflower Compact." The forty-one signers are known as "The Pilgrim Fathers." December 21, 1620, the Pilgrims went ashore in a cove already known on the chart of Captain John Smith as Plymouth. They are said to have stepped from the boat to a large bowlder, the only one in sight. It is known as Plymouth Rock. In 1820 it was surmounted by a square granite canopy, resting on four pillars.

Although the Pilgrims built huts and a common dwelling house they suffered severely from cold and want of proper food. They were a stouthearted people. When spring came the Mayflower, which had wintered in the harbor, prepared to set sail. Although half of their original number lay in the little burying ground not a voice was raised in favor of returning to England. When reduced to shellfish and water for food devout Elder Brewster still raised his voice and gave thanks cheerfully that they were "permitted to suck of the abundance of the seas and of the treasures hid in the sands."

The Pilgrims held their meetings in a square log house, on the flat roof of which six small cannon were placed to repel possible attacks of the Indians. The building was surrounded by a stockade of timbers on end, thus serving both as a meeting house and as a fortification. The people were assembled to service by the tap of a drum and carried their guns with them. In the spring they were visited by Samoset and Squanto, Maine Indians, who had learned a little of the English language from fishermen who resorted to their coast. They served as interpreters between the governor and Massasoit, a friendly chief of the Wampanoags, who taught the Pilgrims "how to set their corne, wher to take fish, . . . and never left them till he dyed." From the Indians they learned also to place a fish in each hill of corn to enrich the soil. After many struggles the Pilgrims succeeded in making homes and in shipping enough furs to pay off the merchants to whom they were indebted.

The Plymouth colony was the second permanent English settlement in North America. As compared with the Puritan settlers who later arrived in Massachusetts Bay the Pilgrims were poverty stricken and, we may say, uneducated. The colony was

never large, never wealthy, yet their influence in the affairs of New England justified Bradford's oft quoted saying: "Out of small beginnings great things have been produced; and, as one small candle may light a thousand, so the light here kindled hath shone to many, yea, in some sort to our whole nation."

Aside from Plymouth Rock, which has been mentioned, there are still many mementos of the Plymouth colony. A Pilgrim museum was founded in Plymouth. Here and in the houses of the quiet old village, now the oldest town in America, Jamestown having disappeared, the tourist is shown Elder Brewster's chair and the chair of Governor Carver; the spinning wheel used by Governor Bradford's family; the Dutch cradle in which the first Plymouth child was rocked; a chest, a mortar, and a pewter plate belonging to Edward Winthrop; a huge iron kettle and pewter platter brought over by Miles Standish; quite a collection of spectacles, canes, a brass candlestick, a slipper, a cap, and many other articles owned by various members. There are samples of needlework, including a fragment of a quilt that once belonged to Rose Standish, the captain's first wife. The famous captain's sword, a Persian blade, is thought to date from the time of the Crusaders. A society of Mayflower descendents was organized in New York in 1894.

In 1920 celebrations of the three hundredth anniversary of the landing of the Pilgrims were held throughout the country.

See CARVER, JOHN; BRADFORD; WHITE; BREWSTER.

Pilgrim's Progress. See BUNYAN.

Pillars of Hercules. See HERCULES, PILLARS OF.

Pillory, an instrument of punishment introduced into the colonies from England. It consisted of two heavy boards fastened edge to edge by means of a hinge. Three holes, one for the neck and one on either side for a wrist, were cut in the adjacent edges. The two planks were fastened like a guideboard to an upright post standing usually on a platform. The holes were about five feet from the platform, at such a height that the head and hands could be placed through them and held firmly. The culprit on whom this ignominious punishment was inflicted was obliged to stand in this painful position during the will of the magistrate. As might be supposed, anyone condemned to the pillory might be also pelted with rotten eggs and mud and subjected to the jeers of the rabble. In the case of the punishment of a popular hero by an obnoxious magistrate the populace crowded round, sheltered the prisoner from the sun, and did everything possible to make him feel that he was the hero of the company. Even women were punished in the pillory. The pillory was once common throughout medieval Europe. Putting in the pillory was the usual punishment meted out to the users of false weights, common scolds, perjurers, ribalders, and writers of seditious articles. The stocks, the pillory, the whipping post and the ducking-stool are associated in history. The pillory was abolished in England in 1837. Offenders were set in the pillory in Prince Edward Island as late as 1860. See STOCKS.

Pimento, a small tree of the West Indies. The family to which the pimento belongs comprises some 500 tropical and subtropical species of trees and shrubs, including the East Indian clove. The pimento is cultivated in Jamaica. It is a beautiful and highly aromatic tree. It grows about 20 to 30 feet high and has dark green, shiny, oblong leaves about four inches in length. Panicles of white, fragrant flowers are succeeded by small dark purple berries. The dried fruit constitutes the well known pimento or allspice of commerce. The berries, which are of about the size of peas, are dried in the sun. Each contains two round seeds. Fruit, bark, and leaves yield the oil of pimento. This oil, like that of cloves, is a remedy for toothache.

Pimpernel, a genus of plants belonging to the primrose family. The common pimpernel grows in waste, sandy lands. It has been introduced into eastern North America from Europe. It has a wheel-shaped, five-pointed corolla, with almost no tube. The flowers vary from scarlet and purple to blue and white. They close quickly at the approach of bad weather. The popular name in England is "poor man's weather glass." "The weather-wise pimpernel," say the poets.

Pin, a well known article of daily use in the toilet. Ordinarily a pin may be described as a bit of wire having a sharp point at one end and a blunt, round head at the other. In early days pins were made by hand and were sold in bulk by the ounce. Each pin was hammered straight, pointed, headed, and polished by hand work. Now these operations are performed by a machine into which the wire is fed from a reel. The pins fall rather faster than one per second into a chemical bath and are tinned to prevent rust. A sticking machine crimps the paper and thrusts the pins into uniform rows. The same factory is likely to engage in making pins, needles, hairpins, safety pins, and hooks and eyes. An enormous number of pins is manufactured annually in the United States, as well as safety pins, etc. Pins are not a modern invention. They have been found in the burying places of the ancients. Costly pins with gold heads have been found in Egyptian tombs. Gloucester and London were early centers of pin-making, but the British business centered finally in Birmingham, the home also of steel pens. Pin-making, like many other enterprises, was undertaken in America during the Revolutionary War when the supply from the Old World was cut off. The first pin machine appeared in 1824. A better one was invented in 1831. The United States census for 1920 does not give separate statistics for the manufacture of pins, but groups pins, needles and hooks and eyes together. In 1920 these combined industries had 92 establishments and employed 9,294 wage earners. Their total output amounted to $29,305,000.

Pinchbeck, an alloy of three or four parts of copper with one of zinc. It was hit upon by Chr. Pinchbeck, a London watchmaker of the eighteenth century. The alloy has the appearance of gold. It is much used in the manufacture of cheap jewelry. From its application to bogus gold the term pinchbeck has extended to shams generally, as "pinchbeck society," "pinchbeck patriotism," etc.

Pinchot, Gifford (1865-), an American forestry expert and political leader, commissioner of forestry of Pennsylvania from 1920 until his election to the governorship in 1922. He was born at Simsbury, Conn., and was graduated from Yale University in 1889. He subsequently studied forestry in England, France, Germany and Switzerland. Mr. Pinchot began the first systematic forest work ever done in America on the estate of G. W. Vanderbilt at Biltmore, N. C. His work received general attention, and in 1893 he established himself in New York as a consulting forester. In 1896, he was appointed a member of the National Forestry Commission, and from 1898 to 1910 was forester and chief of the United States Bureau of Forestry, which later became a division of the Department of Agriculture. In 1902, he inspected the forests of the Philippine Islands and recommended an island forest policy. He also served on commissions dealing with forest conservation, inland waterways, public lands, etc. In 1909, Mr. Pinchot engaged in a controversy with the Secretary of the Department of the Interior, Mr. Ballinger, regarding the latter's conduct of his department, claiming that the people's interests were not being served. The specific cause of the controversy was, said Mr. Pinchot, the granting of claims to Alaskan coal lands when the claims were of doubtful legality. President Taft dismissed Mr. Pinchot for insubordination in 1910. An investigation followed. Mr. Ballinger was held blameless, but the weight of public opinion was with Mr. Pinchot. Mr. Pinchot is one of the founders of the Pinchot School of Forestry at Yale; he was professor of forestry at Yale after 1903; and after 1910, president of the National Conservation Association.

Pinckney, Charles Cotesworth (1746-1825), an American soldier and statesman who upon Talleyrand's insinuating that a gift of money might insure French recognition of the United States is said to have replied "So be it then; millions for defense, sir, but not a cent for tribute." He was born at Charleston, S. C., and was educated in England, at Oxford and at the Middle Temple. He also studied for a time at the Royal Military Academy, Caen, France. In 1769 Mr. Pinckney began law practice in his native city. He was a member of

the first provincial congress of South Carolina in 1775, and served with honor in the Revolutionary War, participating in the battles of Brandywine and Germantown.

In 1796 Mr. Pinckney was sent as United States Minister to France. His reception was refused, and the Directory threatened him with arrest. He thereupon retired to Amsterdam, and returned to America in 1797. When he returned to France as a joint commissioner with Elbridge Gerry and John Marshall, Mr. Pinckney's reception was again unfavorable. It was during this second mission that he made his well known reply to Talleyrand. In 1880 he was the Federalist candidate for the Vice-Presidency, and in 1804 and 1808 for the Presidency.

Pindar, pĭn'dar, a Greek lyric poet. He lived about 522-443 B. C. He was a citizen of Thebes. He claimed descent from Cadmus the father of letters. Pindar learned to compose to the accompaniment of the flute. His earlier odes were so profuse in allusions to mythology that a rival poet advised him to "sow with the hand, not with the sack." His reputation in Greece was such that when Pausanias, king of Sparta, was burning Thebes, some one wrote an inscription over his door, "Burn not the house of Pindar the poet," thus saving it from general destruction. The same anecdote is told of Alexander's sack of Thebes. Among the subjects of Pindar's music was an ode in honor of Apollo.

Pine, the leading genus of coniferous trees. There are over seventy different pines, all native to the northern hemisphere, chiefly in the temperate zone. Some forty species are found in North America. Our most important species is the white pine, found from Newfoundland to Minnesota and south along the mountains to Georgia. Maine is known as the Pine Tree State. The white pine cut of Michigan, Wisconsin, and Minnesota in the nineteenth century exceeded 286,000,000,000 feet. The corresponding pine of the South is the long leaved, yellow, or Georgia pine, found from Virginia to Texas. These two are the favorite pines of the lumberman. Two of the most worthless pines are the Bank's or jackpine of the North and its southern mate, the Jersey or scrub pine.

The white pine is one of the most valuable trees for lumber, and its popularity has been so great that the great white pine forests that extended across the northern part of the United States from Maine to Minnesota, have been converted into lumber. The entire cut of white pine in the United States in 1919 was 1,723,642 thousand board feet, and the cut of yellow pine for the same year was 13,062,938 thousand board feet. Formerly the output of white pine lumber was larger than that of any other variety. In 1919 it ranged sixth.

Pine lumber is used in many ways. In addition to building purposes, it is used for matches, telegraph poles and railway ties. Tar, turpentine and rosin are made from pine balsam, and a good grade of alcohol is made from pine saw dust. See CONIFER; TAR; LUMBER.

Pine Bluff, a city of Arkansas, on the Arkansas River. It has thriving commercial and industrial interests as well as numerous public and educational institutions. The leading manufactures are cottonseed oil, cotton gins and compressors, lumber, furniture, boiler and sheet iron, foundry and machine-shop products. Railway shops, feed-mills, and printing houses are other industrial establishments. The city has electric lights, water works, an electric street car ssytem, a free public library, and public parks. It has freight and passenger service on the river as well as on five railroads. It is the seat of a normal school for girls, and of St. Joseph's Academy. In 1920 the population was 19,280.

Pineapple, a fruit without relationship to either the apple or the pine, but so called from its resemblance to a pine cone. It is now cultivated chiefly in the West Indies. Large numbers were exported formerly to the United States, but our supply now comes chiefly from Florida.

In spite of one or two setbacks from frost the pineapple industry of Florida has risen to considerable proportions. The annual market yield in this state is approximately 800,000 crates. Dry, sandy lands have been found very favorable to its growth. A considerable part of the pineapple crop is raised on the Florida Keys, where the soil resting on the coral limestone is barely an inch in depth. The

Banana stem pipe of an African pygmy.

Pipe of clay and wood.

Ashanti clay pipe.

Ashanti clay pipe

Clay pipe of Loango.

African clay pipe

Jointed pipe.

Water pipe, Lake Nyassa.

South African pipe of horn.

East African water pipe.

Uganda pipe.

Andaman pipe.

Kamerun pipe.

Togo pipe.

Kamerun clay pipe

East African pipe.

African pipe.

Pipe made from the leg of an emu.

Kongo water pipe.

Patagonian pipe.

Nut pipe, South America.

African pipe.

Eskimo pipe.

Paraguay pipe.

Eskimo pipe.

Indian peace pipe.

Clay pipe, Mound Builders.

Native pipe, New Guinea.

Clay pipe, North American Indian.

Sandpile smoker.

PIPES.

plant is propagated usually from suckers which sprout from the short stem after the fruit has been cut off. The plants are set in short rows in beds so that they may be cultivated with a long-handled scuffle hoe without entering the bed. The fruit is cut about a week before it is fully ripe. Each "apple" is wrapped separately in a piece of brown paper. The fruit is sorted according to size and is packed 18, 24, 30, 36, 42, 48, and 54 to the half bushel crate. A single fruit may weigh anywhere from half a pound to fourteen pounds.

Of late pineapple growers have fallen in with the idea of building sheds to protect their beds. Sides and tops are built of lath or slats nailed to stringers or woven with wire to form open lattice work or screens. It is claimed that the heat of the sun is tempered, and that in frosty, catchy weather the screens afford protection against freezing. Such sheds cost $500 an acre. An acre well set begins to yield in eighteen months and produces from 8,000 to 15,000 pineapples a year for eight or ten years. A heavy expense for fertilizers is required. Heart rot, blowing sand, blight, a red spider, a scale insect, and mealy bugs combine to render the growers' lot far from an easy one.

Pineapple Fiber, the fiber yielded by the leaves of the pineapple plant. In China and the Philippines the fleshy surfaces of the long leaf are cut off with a plane. The fibers are then removed from about the middle of the leaf by hand. They are steeped in water, washed, dried, and bleached. Pineapple fiber is long, white, and silky, and is one of the strongest of vegetable fibers. A small strand tested against an equal quantity of flax sustained a weight of ninety pounds more than that sustained by the flax. It is prepared readily for spinning. The individual filaments are flexible, fine, and of regular size. In Europe pineapple fiber is used in the manufacture of novelty fabrics, and in mixtures with silk, wool, and cotton. In China a coarse cloth resembling grass cloth is made from it. In Central Mexico it is used in making ropes, twine, thread, hammocks, and bagging. In the Philippines the famous pina cloth is made from the fiber of the wild pineapple. Pina cloth is thin, soft, of delicate texture, and great durability. Efforts have been made to utilize the fiber from the leaves of the Florida pineapple, but with indifferent success. A ton of pineapple leaves yields from forty-five to sixty pounds of fiber. No practicable machinery has yet been invented for extracting the fiber from the leaves.

Pinkerton, Allan (1819-1884), a celebrated American detective. A native of Scotland. Pinkerton came to this country a penniless boy. His first efforts at earning money were sawing wood at fifty cents a day. His first efforts in the detective line were in the secret service of Chicago. He was the first detective of that city. In 1850 he set up independently and made a specialty of bank and express robberies. Pinkerton accompanied President Lincoln to Baltimore on the way to his first inauguration. He was attached to the secret service of the Army of West Virginia. He joined McClellan's command on the peninsula in the same capacity, and became finally known as Major Pinkerton. Toward the close of the war he established Pinkerton's National Detective Agency at Chicago, with offices at New York and Philadelphia. Pinkerton was a man of great energy, with a dignified demeanor, and notwithstanding that he was familiar with all the arts and wiles and iniquities of criminals, he was considered the soul of honor and distinctly repudiated the adage, "Set a rogue to catch a rogue." He wrote a volume of reminiscences, *Thirty Years a Detective*. He is credited with breaking up the "Molly Maguires" of the Pennsylvania coal region. See MOLLY MAGUIRES; BERTILLON.

Pinks. See CARNATION.

Pipe, an implement for smoking tobacco. It consists essentially of a bowl, in which the tobacco is burned, and a stem, through which the smoke is drawn. The clay pipe and the corncob pipe are well known popular varieties. Immense porcelain pipes, often highly decorated, are favorites with the Germans. The oriental hooka is the largest pipe of all. The bowl rests in a reservoir filled with water, through which the smoke is drawn and cooled before reaching the mouth. According to the last census the manufacture of pipes and smokers' imple-

ments in the United States amounts to about $3,000,000 a year. There are large importations, also, of smokers' articles. See MEERSCHAUM; BRIAR ROOT; CALUMET.

Pipe Lines. See PETROLEUM.

Pipestone. See CALUMET.

Piqua, Ohio, an industrial city, is on the Great Miami River and on the Pennsylvania, Western Ohio and Baltimore & Ohio railroads, 26 miles northwest of Dayton and 72 miles west-northwest of Columbus. The manufactures are stoves and ranges, furniture, strawboard, woolen and knit goods, felt, blankets and wood products.

The city has an attractive public park, good schools, graded and high, Ball Memorial Hospital, a Federal building and the Schmidlapp Free School Library. The waterworks are owned and operated by the municipality. Population, 1920, 15,044.

Pique, pē-kā′, a stout cotton fabric ornamented with a rib, or small pattern in relief. The name pique is from a French word meaning "to prick."

Piracy, the crime of robbery on the high seas. It is an offense against the human race as a whole, and the pirate, or highwayman of the sea, can demand protection from no law, but can be made to appear before any court of justice in the world. Piracy is distinguished from privateering in the following respects. The pirate sails under no national flag and makes his attack on any nation; the privateer plunders and destroys only the vessels of the enemy and sails under the flag of a warring power. The pirate, or buccaneer, is punished by a confiscation of his ship and the hanging of the crew; the penalty for privateering is generally imprisonment. In Phoenicia piracy was considered a lawful undertaking; the Greeks followed it as a dignified enterprise. The Norse vikings have probably been the boldest, most reckless, and the most feared of sea-rovers and freebooters. In England and America various acts on the high seas have been declared acts of piracy by law and statute. The slave-trade was declared to be piracy by an act of Parliament in 1824. In the United States trial for the offense of piracy is made before the federal courts; in England the matter was formerly referred to the courts of admiralty.

Piraeus. See ATHENS.

Pirithous, pī-rĭth′ō-us, in Greek legend, the king of the Lapithae in Thessaly. It was at his wedding to Hippodamia that the famous battle between the Lapithae and the Centaurs occurred. After Hippodamia's death Pirithous and his friend Theseus determined to wed daughters of Zeus. Theseus carried off Helen from Sparta, Pirithous aiding him. Pirithous thought he would like to get possession of Persephone, wife of Hades. The two friends descended, therefore, to the lower world, but they had been too bold. Hades seized them and fastened them to a rock. When Hercules visited Hades at a later time he released Theseus, but there was no help for Pirithous. Castor and Pollux recovered their sister, Helen, and took her home again.

Pisa, pē′zä, a city of Italy. It is situated on the Arno River about six miles from the Mediterranean. It is the capital city of the Italian province of that name. It lies in the midst of a beautiful plain surrounded by mountains of marble, clothed to their summits with pines and other forest trees. It is an ancient city. It was one of the original twelve cities forming the Etruscan League. During the Middle Ages, it was one of the powerful independent cities of Italy. Genoa was its chief rival. It fell finally under the dominion of Florence. The present population is about 62,000. There are manufactures of cotton, glass, hats, machinery, and articles of alabaster. The city is also a center of trade with the surrounding country.

The reader's interest in Pisa centers, however, in its past. It is the seat of an ancient university founded in 1338, one of the earliest in Europe. There are still over 1,000 students. There is a museum of natural history, a botanical garden, and a library of 130,000 volumes. The streets of the city are crooked and have an antique appearance. The better quarters are built up almost entirely of marble. A group of four buildings possesses unusual interest from an architectural point of view. They are the Cathedral, the Baptistery, the Campanile, and Campo Santo.

The Cathedral is built of dazzling white marble. It has the form of a Latin cross, with an internal length of 311 feet and

breadth of 252 feet. The nave is 109 feet in height. A cupola surmounts the intersection of the nave and the transept. Michelangelo is said to have designed the main altar. Plans for portions of the interior work were made by Cimabue. It is one of the great cathedrals of Europe.

The Baptistery is a circular building 100 feet in diameter. It is surrounded by pillared galleries and is surmounted by a conical dome 190 feet in height. The Campanile, or Bell Tower, is better known as the Leaning Tower of Pisa. It is circular in form. The walls at the base are thirteen feet in thickness, and are constructed of marble throughout. The basement is surrounded by a range of arches resting on fifteen columns, above which rise six arcades of thirty columns each. The eighth and last story is smaller than the rest. It contains the bells. The top is reached by a circular stone stairway which winds around the edifice with so gradual an ascent that one is hardly aware he is climbing upward. The entire height is 183 feet. Owing to an unequal settling of the foundation, the tower is thirteen feet eight inches out of perpendicular.

The Campo Santo, or cemetery of the cathedral, lies in the immediate vicinity. It is an oblong edifice about half a block in size. To be more particular, it is 415 feet long and 138 feet wide. A central court is surrounded by a cloister supported on columns. The cloister itself is a museum of painting and sculpture. The central court or burying plot is one of especial sanctity. Between 1188 and 1200 the archbishop of Pisa caused fifty-three shiploads of earth to be transported to this spot from Mount Calvary. See CAMPANILE.

Pisistratus, pĭ-sĭs′trȧ-tŭs, a Greek Tyrant who died 527 B. C. He was the son of Hippocrates and soon became recognized as a friend and ardent benefactor of the poor. He favored democracy and in 560 B. C. when his attack on the acropolis met with success he attained to supreme power. He was called the "Tyrant of Athens" and ruled seventeen years. He was exiled twice, remaining in banishment for sixteen years. He ruled prudently and made few changes in the laws of Solon who had departed from the country. He was a patron of the arts, science, and agriculture. He sent the idle citizens to the fields to cultivate the soil. He arranged for the editing of the poems of Homer and established a public library.

Pistachio, pĭs-tä′shĭo, a small oriental tree which yields pistachio flavoring. It is a native of Persia and Syria, but has been naturalized elsewhere, particularly in southern Europe, northern Africa, and California. The pistachio flavoring and green coloring matter used in candies, ices, frostings, etc., is an oil pressed from the seed of the fruit. The stone of the fruit, within which is the seed, as in a plum, is the pistachio nut of commerce, sometimes called the green almond. The entire fruit is about the size of an olive. The tree is about twenty feet tall, and has pinnate leaves.

Pitcairn (pĭt-kârn′) **Island,** a British possession in Polynesia. The island has an area of two square miles, with a population of 126. The principal productions are cocoanuts, bananas, pineapples, coffee, tomatoes, Indian corn, and arrowroot. Poultry and goats are raised. Disease is almost unknown. The islanders are governed by a Parliament of seven members. The inhabitants are of mixed British and Hawaiian ancestry. See MUTINY.

Pitch, pĭch, a dark, sticky product obtained by drying out tar, and from the residue of turpentine distillation. It is made in tar-producing countres. It is used chiefly in calking ships, in protecting submerged woodwork, and, to some extent, in medicine, as in white-pine tar compounds for colds. A pitchy black night is a synonym for utter darkness. See TAR; TURPENTINE.

Pitch, in music the character of a sound which is dependent on the frequency of the vibrations of the sounding body. The standard pitch adopted by scientists is that of a tone produced by a string vibrating 256 times per second for lower C, or 512 vibrations for upper C, being the eighth and ninth powers respectively of 2. Musicians have, however, decided that better and more brilliant effects are produced by sharpening to a concert pitch, which, for upper C, is placed in England at 538 vibrations per second; in France, at 522; and in Germany, at 528. See SOUND.

Pitcher Plant, a plant with leaves transformed into cups or pitchers. These "pitchers" are exceedingly curious organs. A sticky liquid is usually found at the bottom of the cup in which insects are held and apparently digested. There are two groups of pitcher plants. A tropical Malay group includes about thirty-five species. The pitchers are on the ends of the leaves and are shaped like mugs, bottles, or trumpets, varying in size from three to twelve inches in length, and from one to nine inches in diameter. In color they are red, yellow, scarlet, and green, spotted, streaked, or plain. The Rajah of Borneo has pitchers a foot deep and nine inches wide. Some pitcher plants are swamp plants, some terrestrial, and one, with a hairy, bulging, green pitcher, nine by three inches, with a spreading yellow lip, grows as an air plant, twenty to a hundred feet above ground, on the forest trees of Borneo.

In comparison with these gorgeous, tropical hothouse marvels, our American pitcher plants are exceedingly modest; but anyone who has sat on the sphagnum moss of a bog beside his first pitcher plant need envy no tropical collector or owner of a conservatory. The pitcher plant, side-saddle flower, or huntsman's cup of the eastern United States grows in bogs; several upright pitcher-shaped leaves grow in a cluster around a perennial root; a single flower stalk carries a single nodding purple flower; the style is expanded into an umbrella, overarched by five fiddle-shaped petals. A yellow pitcher plant, called the trumpet-flower, is found in the bogs of Virginia and southward. The California pitcher plant grows at an altitude of 5,000 feet in the sphagnum bogs of the Sierra Nevadas, along with sundews and rushes. An array of bristles pointing downward prevents the return of an insect once started down the mouth of the slender twisted pitcher.

Pith, the central portion of many plants, as of the elder, cornstalk, palm tree, etc. The principal service of pith to the plant is as a storehouse of starch. See CELLULOSE.

Pitman, Isaac (1813-1897), the English inventor of modern shorthand. He was a native of Wiltshire and was educated in London. In 1832 he became master of a school in Barton-on-Humber. Five years later he published his *Stenographic Sound Hand,* the basis of modern stenography. He also founded the *Phonographic Journal,* afterward known as the *Phonetic Journal.* One of his last contributions was a complete manual, known as *The Shorthand Instructor for Commercial Schools.* He was identified with a movement for the simplification of spelling, and is credited with having suggested to the British government the present method of collecting postage in the form of stamps instead of money. A brother, Benn Pitman, established a school of shorthand at Cincinnati in 1853.

Pitt, William, Earl of Chatham (1708-1778), a famous English statesman. He was born at Westminster and was educated at Trinity College, Oxford.He served for a time as a cornet in a regiment of dragoons. He entered Parliament in 1735. He remained in public service for the rest of his life. He rose to be premier. He was for many years the head of the British government. In a speech on the Excise Bill, he spoke as follows on the rights of the common people. "The poorest man may, in his cottage, bid defiance to all the force of the crown. It may be frail; its roof may sink; the winds may blow through it; the storms may enter it; the rain may enter in; but the king of England cannot enter. All his forces dare not cross the threshold of the ruined tenement."

Pitt shaped the policy of Great Britain during the French and Indian War. The acquisition of Canada was due largely to him. The city of Pittsburg, occupying the former site of Fort Duquesne, was named in his honor. Although Pitt believed in the authority of Parliament "to bind the colonies in all cases, whatsoever," he was regarded as a man of just views and a friend of the colonists. In 1766, when the repeal of the Stamp Act was under consideration, he said, "Taxation is no part of the governing or legislative power. Taxes are the voluntary gift or grant of the commons alone. I rejoice," said he, "that America has resisted. Three millions of people so dead to all the feelings of liberty as voluntarily to have become slaves would be fit instruments to make slaves of the rest."

In a speech of December, 1777, with ref-

erence to the employment of Hessians and Indians, he said: "If I were an American, as I am an Englishman, while a foreign troop was landed in my country, I never would lay down my arms,—never! never!"

Pitt, William (1759-1806), a British statesman. He is known in history as "The Younger Pitt." He was the son of the Earl of Chatham, the subject of the preceding sketch. He was educated at Pembroke Hall, Cambridge, and was noted for his knowledge of mathematics and classics. He entered Parliament within two years after his father's voice ceased to be heard there. In politics he was a Whig. He opposed Burke. At the age of twenty-four he was made prime minister. Like his father, he was the leading statesman of England for many years. Among his public measures was the passage of the so-called India Bill, which placed the affairs of the East India Company under the management of a government board. The union of the Irish and the English Parliaments was brought about, no doubt by bribery, during his administration. He formed a coalition of the European powers to oppose the rising influence of Napoleon. He was a man of patriotism and eloquence, but a poor manager of finance. The measures by which he undertook to raise public revenues were not altogether successful. He left his own affairs in a tangled condition. At his death Parliament made a special appropriation of $200,000 to pay off his personal debts.

Pittsburg, Kans., an industrial city, is 129 miles south of Kansas City, on four important railroads. It is in the center of a productive bituminous coal field. It contains shops of the Kansas City Southern Railroad. The principal manufactures are mattresses, knives, flour, machine shop products, vitrified and building bricks, tile and artificial stone. It is the seat of the Kansas Manual Trtining Normal School, and has a senior high school, a junior high school, graded public, and parish, schools, and a fine library. In 1920 the population was 18,052.

Pittsburgh, a city and metropolis of western Pennsylvania. It is situated at the junction of the Alleghany and the Monongahela rivers. Fort Duquesne was situated at the far extremity of the peninsula between the two rivers. It was captured from the French by the English in 1758. The name was changed, at the suggestion of Washington, to Fort Pitt in honor of William Pitt, prime minister of England. The old blockhouse built by General Bouquet in 1763 still stands. It is preserved by the city with great care. The city of Pittsburgh was laid out around the fort in 1764. It has received continual additions of territory, including Allegheny, until in 1910, its population reached 533,905, increased to 588,193 in 1920.

The city owes its early commercial development to its situation at the head of deep water navigation. It was for many years a center of distribution for the upper Ohio Valley. The building of railroads only added to the commercial importance of the city.

Pittsburgh is, above all, an industrial city. The greatest coal fields in the world are in the immediate vicinity, or are easily reached by water. The most productive oil fields and gas wells known are in western Pennsylvania. Excellent iron ores are close at hand, making Pittsburgh a vast industrial encampment and winning for it the nickname of "The Iron City." Clouds of smoke float in the air; armies of workmen tend the forges and mills; the rattle and roar of machinery and the clink of hammers is heard in every direction. In the production of coke, pig iron, steel, iron for bridges and buildings, steel rails, armor plate for battleships, and glass, Pittsburgh leads the cities of North America and, in some items, leads the world. Most of the beer bottles used in the United States are made here. Cork is imported in flat sheets from Europe and is cut into corks for bottles here by the largest cork factory in the world. There are important manufactures of tableware, locomotives, steam engines, salt, brick, stoves, brassware, bronze goods, white lead, leather, paper, and pottery.

Pittsburgh is the center of the lumber industry of western Pennsylvania. There are packing plants that rival the great centers of the West. The largest preserving and pickling works in the United States are located here. The chief works of the United States Steel Corporation, of which

Andrew Carnegie was formerly the leading spirit, are located at Pittsburgh. George Westinghouse, the inventor of the automatic air brake, rotary engine, a railway frog, and other railway appliances, made his reputation and his fortune at Pittsburgh. The great National Glass Trust has its central offices and works here. Counting large and small, there are nearly 5,000 manufacturing establishments in Pittsburgh, employing a capital of half a billion dollars.

Pittsburgh is also a city of churches. There are over 300 edifices. The early settlers were chiefly Scotch. The city is still a center of Presbyterianism. A Roman Catholic and a Protestant Episcopal bishop reside here. The *Pittsburgh Gazette* (now the *Gazette-Times*), the oldest paper in the Mississippi Valley, was established in 1786.

The usual system of public instruction is maintained liberally. There are several colleges, the University of Pittsburgh being entitled to the larger share of notice. In 1923 it celebrated its 136th anniversary. It contains eleven distinct schools, has a faculty of 525 members, and enrolls over six thousand students. It is a semi-state institution, sharing with the University of Pennsylvania and State College the legislative appropriations for higher education. It is not denominational. Here also is located the Pennsylvania College for the Blind, the Pennsylvania College for Women, three Presbyterian Theological seminaries, several Roman Catholic institutions, and the Carnegie Institute, including among its departments the well-known Carnegie technical schools. The buildings cost $6,000,000. Andrew Carnegie gave $2,000,000 for the encouragement of manual training. The city is also indebted to the same public-spirited citizen for the Carnegie Free Library. It already shelters 150,000 volumes made accessible to the reading public through a central building and several branch libraries. An anonymous donor established in 1909 a fund of $250,000, the income of which is to be expended to promote the welfare of the teachers in the elementary public schools of the city. The county bar possesses the best equipped law library of the kind in the United States. The city takes pride in fourteen hospitals and in numerous charitable institutions, including a newsboys' hall, homes for the aged, for working girls, orphans, widows, etc. Public parks, boulevards, and zoölogical gardens afford places of outdoor recreation and amusement. Among notable buildings are the Courthouse, Carnegie Library, the United States Custom House and Postoffice, the Frick Building, the Carnegie Building, the Oliver Building, and the Soldiers' and Sailors' Memorial Building. Forbes' Field and Stadium, costing over one million dollars, the home of the Pittsburgh "Pirates," is the world's finest ball park.

In 1911 Pittsburgh received from the Legislature a new improved charter, under the provisions of which it is now governed by a single-chambered council of nine members, elected at large by the voters of the city, known as "The Pittsburgh Plan."

See STEEL.

Pittsfield, Mass., a manufacturing city and the county seat of Berkshire County, is 150 miles west of Boston, on the Boston & Albany and the New York, New Haven & Hartford railroads. It is situated in a picturesque region of hills, valleys and lakes, 1,000 feet above sea level. The chief manufactures are electrical machinery and supplies, silk, cotton and woolen goods, paper and fine stationery, automobile accessories, underwear and men's and boys' clothing. The city contains the Museum of Natural History and Art, the Henry W. Bishop Training School for Nurses and two other training schools, high schools and a splendid library connected with the Berkshire Athenaeum. Pittsfield also contains the Berkshire County court house, St. Luke's Hospital and the Hillcrest Training Hospital, the latter for surgical nurses. There are twenty-three school buildings. In 1920 the population was 41,763.

Pittston, Pa., an industrial city, is on the Susquehanna River and on the Lehigh Valley, Delaware & Hudson, Erie, Lackawanna and Central of New Jersey railroads, 9 miles southwest of Scranton. The industrial life of the city is intimately connected with the mining and shipping of coal, though there are also manufactories of brass ware, stoves, clay products, paper, silk, knit goods and iron ware.

Pittston has a convent, a library, good public schools, a Y. M. C. A., and handsome municipal buildings. The city was founded in 1770, but did not receive a charter until 1894. In 1920 the population was 18,497.

Pius IX (1792-1878), pope from 1846-1878. He succeeded Gregory XVI in 1846. At this date the pope ruled a limited territory in Italy. His first measure was the liberation of 2,000 political prisoners, a step hailed by liberal people everywhere with joy. He was a man of progressive spirit, but later came under the influence of conservative cardinals who prevented him from carrying out his original ideas. He lost favor with the Roman patriots. His territory was held for him by French troops. In 1870, when these were withdrawn, Victor Emmanuel took possession of Rome. Pius retired to the Vatican, never going outside of his gardens, declaring that he was a prisoner in his own house.

The most important ecclesiastical event of his pontificate was the enunciation of the doctrine of infallibility. This famous doctrine was promulgated by a general council held at the Vatican in 1870. The following quotation gives the gist of the doctrine:

> The church can neither deceive nor be deceived in matters of faith and morals. . . . The Roman Pontiff, when he speaks ex-cathedra, that is to say, when, in the exercise of his office of pastor and teacher of all Christians, he, in virtue of his supreme apostolic authority, defines that a doctrine on faith and morals is to be held by the whole church, by the assistance of God promised to him in the person of blessed Peter, has that infallibility with which it was the will of our Divine Redeemer that His church should be furnished in defining a doctrine on faith or morals, and that therefore these definitions of the Roman Pontiff, of themselves and not through the consent of the church, are irreformable.

The promulgation of this doctrine offended a small percentage of what are known as Old Catholics, chiefly in France and Germany. They form a small sect holding to the doctrines of the church in general, but opposed to the doctrine of infallibility. Pius served thirty-two years—longer than any other pope.

Pius X (1836-1914), the successor of Pope Leo XIII. Born near Venice of humble parentage, Guiseppe Sarto was educated in the college of Castel Franco, and in the central seminary at Padua. He was ordained to the priesthood in 1858 and occupied successively the parishes of Tombolo and Salzano, from whence he was called to become canon and chancellor of the diocese by the Bishop of Treviso. His piety and spirituality led to his becoming spiritual director of the college there, dean of the chapter, vicar-general, and suffragan till he was made Bishop of Mantua. In 1893 he was created a cardinal and assigned to the patriarchate of Venice. His ten years there so endeared him to his constituency and his efforts along charitable, benevolent, coöperative, and sociological lines were so conspicuous that his selection as pope in 1903 was a most natural consequence.

He was a man of fine physique, attractive personality, and admirable presence. As a speaker he was eloquent and convincing, his voice pleasing and with a distinct charm. His habits were simple, and his tastes frugal.

Pius XI. On February 6, 1922, Cardinal Achille Ratti, Archbishop of Milan, was chosen Supreme Pontiff of the Roman Catholic Church by the Conclave of Cardinals, and assumed the name Pius XI. Soon after his election, wearing the white robes of his sacred office, which made a striking contrast to the scarlet robes of the cardinals, the new pontiff appeared on the balcony of St. Peter's Church overlooking the square and bestowed his first apostolic benediction on the city and the world, pleading for universal peace. The coronation was signalized by unwonted splendor.

Pius XI was born in Desio, Lombardy, March 31, 1857. He was the fourth son of a weaver. He is known throughout the Church as a man of profound scholarship and wide knowledge, a lover of books, mountains and men. He was educated in the diocesan seminaries of Milan and at Lombard College, Rome, where previously to his ordination in 1879 he received doctorates in philosophy, theology and canon law.

In 1882, he became professor of dogmatic theology and sacred eloquence in the diocesan seminary at Milan. He was appointed chaplain of the Cenacle Convent

and continued in this position for thirty years. In 1888, he was appointed to the staff of the College of Doctors of the Ambrosian Library. During the occupation of this position he displayed unusual literary activity, which is evidenced by a long list of scientific writings and learned publications on various topics. In 1907 he became prefect of the library. In 1913, he became prefect of the Vatican Library and also prothonotary Apostolic.

The Great War, however, put an end to Dr. Ratti's work as librarian. On April 25, 1918, Pope Benedict sent him as apostolic visitor to Poland and as soon as Poland had obtained her independence he was appointed apostolic nuncio to the new Republic. Dr. Ratti faced a situation of great difficulty, but in its solution he displayed such remarkable tact, diplomatic skill and heroism that he succeeded in obtaining a final settlement of both the political and ecclesiastical difficulties which beset the new state. His influence extended far beyond the boundaries of Poland and he was successful in securing the liberation of many prisoners and hostages who were in the hands of the Russian Bolshevists.

Following the settlement of affairs in Poland, Dr. Ratti was appointed Ecclesiastical Commissioner for the plebiscite in Upper Silesia, the appointment being made at the unanimous request of Poland, Germany and the Inter-Allied Commission. He discharged the duties of this difficult position in such manner as to receive the unanimous approbation of all parties.

On June 13, 1921, Dr. Ratti was created Cardinal and appointed Archbishop of Milan. His election to the Papacy on February 6, 1922, was the culmination of his rapid rise in the church, becoming archbishop, cardinal and Pope within a year.

In June, 1923, Pius XI created quite a stir when he admonished France to cease hostile activities in the Ruhr valley, and then after a conference with French authorities, he ordered Germany to make every effort to pay her debts.

Pizarro, pe-zăr′ro, **Francisco** (1471-1541), a Spanish soldier, known in history as the discoverer and conqueror of Peru. He was born in the province of Estremadura, Spain. He died at Lima, Peru, June 26, 1541. His father was a colonel of infantry. Like many other young gallants, he was stirred up by stories of the New World, and found his adventurous way across the Atlantic. He accompanied Balboa's expedition of 1513 which resulted in the discovery of the Pacific Ocean. Subsequently he became a cattle farmer at Panama. Here he became acquainted with a priest, named Hernando, and a soldier of fortune by the name of Almagro. Together they fitted out an expedition for the exploration of the Pacific coast. They had heard rumors of a land of wealth lying farther south. In the course of their explorations, which extended over a period of two years, they became convinced that Peru was a land of immense wealth. Their own means being too slender to bring together an army, Pizarro set out for Spain in the spring of 1528. In the following year he was granted the desired permission to conquer the Peruvian region and was invested with the title of viceroy of a territory extending for 200 leagues along the coast. In 1531 he was able to leave Panama with 35,180 men and twenty-seven horses. He effected a landing on the coast of Peru and proceeded to fortify himself.

In 1532, taking advantage of internal dissensions, Pizarro climbed the mountains and advanced inland. He became the pretended friend of the Indian chief, or Inca, Atahualpa (ä-tä-wäl′pä), yet took him prisoner. For a ransom of $8,000,000 in gold, quickly brought together by his frantic followers, the Inca was set at liberty. Later, in alarm real or pretended lest a conspiracy had arisen for the extermination of his small force, Pizarro ordered Atahualpa to be put to death. His son Manco was set on the throne with many professions of Spanish respect, but was compelled to act the part of a puppet. In 1535 Pizarro founded Lima and set up a government there. A quarrel broke out with his former partner and present subordinate, Almagro, who had in the interval effected the conquest of Chile. In the civil war that ensued the latter was taken prisoner and executed as a traitor. His followers retaliated by the assassination of Pizarro in his governor's palace at Lima, June 26, 1541.

Pizarro, Gonzalo, a younger brother of the conqueror of Peru whom he accompanied there on his second visit in 1531. He became governor of Quito in 1540 and initiated the expedition of Orellano who discovered the head waters of the Amazon. After the assassination of his brother in 1541, he raised an army against the Spanish viceroy and in 1546 overthrew him and became master of Peru. The following year a force from Spain arrived, and Pizarro was defeated and executed.

Placer Mining, a method of collecting grains of gold or other precious metals. Placer mining requires an abundance of water and an abundance of sand, gravel, or earth, containing particles of gold. The sand may be shaken in a pan of water or rocked in a miner's cradle until the precious grains settle to the bottom. Millions of dollars of gold have been taken from the banks of streams in this way. Under typical conditions, however, water is obtained from an elevated source — some distant mountain stream—and is allowed to play through a huge nozzle against the gold-bearing bank of gravel or sand. The earth melts away before the water and runs off in a muddy stream through a long, slightly inclined flume or trough. Cleats are nailed at intervals across the bottom of the trough. A pool of mercury is poured into the trough above each cleat. The particles of gold, however small, are heavy. They settle to the bottom of the trough and roll along till they reach mercury, with which they form an amalgam. After driving the muddy current through the flume a while, the operator finds a bar of amalgam above each cleat. These bars he removes, replacing them by fresh pools of mercury. No matter how rich the soil may be, this kind of mining is out of the question where water cannot be had.

Placer mining reached its highest development in California in the latter part of the nineteenth century. Large corporations were formed, mountain streams were dammed, and a high water pressure was secured. Steel pipes with large nozzles were used, and the force of the water was such that it would wash away river banks or hillsides. The quantity of gold secured was proportionate to the amount of earth washed away, but the silt settled on the lowlands in such quantities as to ruin the soil, and the practice was forbidden by law. See GOLD; MERCURY; AMALGAM.

Plague, plāg. See BUBONIC PLAGUE; BLACK DEATH.

Plagues of Egypt, a succession of calamities which are regarded to have come as an infliction on the Egyptians at the time that Pharaoh refused to emancipate the Children of Israel from slavery. The plagues were ten in number: the turning of the waters of the Nile into blood; frogs; lice; flies; murrain that attacked the cattle; boils; thunderstorm accompanied by hail; locusts eating what the storm had not ravaged; thick darkness; the death of the first-born among the Egyptians of both man and beast. An attempt has been made to explain these calamities naturally. For instance, the red color of the waters of Egypt is attributed to the fact that microscopic organisms swarmed the swamps of Egypt. The rapidly falling water, after flood-time, caused the frogs on the high places to die from lack of water, and their death, together with stagnant waters, were the immediate causes of the breeding of the immense swarms of insects referred to. Again, it is not improbable that these insects became carriers of disease.

Plaid, a garment worn by Scotch Highlanders. See TARTAN.

Plan of Union. See ALBANY CONGRESS.

Plane Tree. See SYCAMORE.

Planets, heavenly bodies revolving about the sun. The ancients noticed that several stars changed position in the heavens and gave them the name of planets or wanderers. It was noted also that they shone with a steady, not a twinkling light. In addition to the sun and moon, five wanderers were recognized and were given the names of divinities,—Mercury, Venus, Mars, Jupiter, and Saturn. The earth was not counted because it was considered the stationary center of the universe. Uranus and Neptune have been discovered later.

Arranged in order of distance from the sun, the planets fall into place in accordance with *Bode's Law,* as follows:

Write a series of 4s.
Add 3 to the second 4.
Add twice 3 or 6 to the third 4.
Add twice 6 or 12 to the fourth 4.

The series may be extended indefinitely by doubling the added number each time. The working of the law may be shown as follows:

1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.
4	4	4	4	4	4	4	4	4
	3	6	12	24	48	96	192	384
4	7	10	16	28	52	100	196	388

In searching for the planet that might be expected to occupy fifth place, astronomers have found large numbers of small bodies with planetary orbits, fragments apparently of a lost planet, to which the name of asteroids has been given.

Using the distance of the earth from the sun as a measure, the names of the planets, comparative distances and Bode numbers may be seen in the following table:

Name.	Distance.	No.
Mercury	0.387	4
Venus	0.723	7
Earth	1.000	10
Mars	1.523	16
Asteroids		28
Jupiter	5.202	52
Saturn	9.539	100
Uranus	19.183	196
Neptune	30.054	388

Choose any well leveled field. On it place a globe two feet in diameter. This will represent the sun. Mercury will be represented by a grain of mustard seed on the circumference of a circle 164 feet in diameter for its orbit; Venus, a pea, on a circle of 284 feet in diameter; the Earth, also a pea, on a circle of 430 ; Mars, a rather large pin's head, on a circle of 654 feet; the asteroids, grains of sand, on orbits having a diameter of 1,000 to 1,200 feet; Jupiter, a moderate-sized orange, on a circle nearly half a mile across; Saturn, a small orange, on a circle of four-fifths of a mile; Uranus, a full sized cherry or small plum, upon a circumference of a circle more than a mile in diameter; and finally, Neptune, a good-sized plum, on a circle about two and a half miles in diameter.—Sir John Herschel.

Plant, any living organism not included among the animals. In a general way plants are distinguished from animals by exhibiting neither feeling nor voluntary motion. For the discussion of relationship to animals, see ANIMAL. Like animals they exhibit the widest variation from the single-celled water slime up through the bacteria, algae, fungi, lichens, mosses, liverworts, ferns, to the higher flowering plants. Scientists are thoroughly agreed that in all this variation there has been a constant evolution from lowest to highest, and that though the forms may appear so diverse, yet they are all related. The course of evolution may not have been in a continuous line, there may be many branches; degeneration may from time to time be found as in the saprophytes and parasites; but the general course has been ever onward and upward.

The manufacture of chlorophyll, or the green coloring matter is often thought to be a characteristic of plants; and so it is except in the case of those which, like the fungi, live off already organized matter. The possession of roots, stems, and leaves is often considered essential to a plant, but this applies to the higher form only. Plants multiply in many ways, the higher ones alone by seeds. The means and devices by which these seeds are transported is nothing short of marvelous, and most plants either by natural means or aided by man, have come to be found in all parts of the world where the climate conditions are suitable to their growth, in many cases even adapting themselves to new conditions. So many of our fruits and vegetables have been cultivated in the United States for so long a time that we think of them as native. In reality few of those in common use were originally American products, but instead represented almost as many countries as do the peoples that have been fused to form the American nation. The following list shows the original homes of some of our garden products: Cabbage and buckwheat came originally from Siberia; celery from Germany; the onion from Egypt; spinach and parsnips from Arabia; the citron from Asia; cucumbers from the East Indies; radishes from China and Japan; horse-radish from the south of Europe; the potato from Peru; and parsley from Sardinia. Of grains, millet was first known in India, while rye came from Siberia. Of fruits, the pear and apple are from Europe, and the quince from the island of Crete. Tobacco is a native of South America; the sunflower came from Peru; the nettle from Europe; while the horsechestnut is a native of Thibet.

Plantain. See BANANA; MANILA.

Plaster of Paris, a well known white, powdery cement. It is made by heating gypsum, a sort of chalky limestone, in a kiln or retort. It was made largely in the vicinity of Paris, from which circumstance the name is derived. When mixed with water it soon hardens or sets like mortar or cement, but it is as cleanly as chalk and is free from caustic properties. It expands slightly in setting, and for that reason is an excellent material for making casts and reproductions of coins, cameos, medallions and statues. It is too soft for durability, but it may be hardened by an addition of alum, borax, or alcohol to the mixture. The surface of the outer coat may be hardened by painting or by dipping in melted paraffin. The material called stucco is formed by mixing glue with the plaster. See GYPSUM; CHALK; LIME.

Plastering. See LIME.

Plating. See ELECTROLYSIS; ELECTROTYPE.

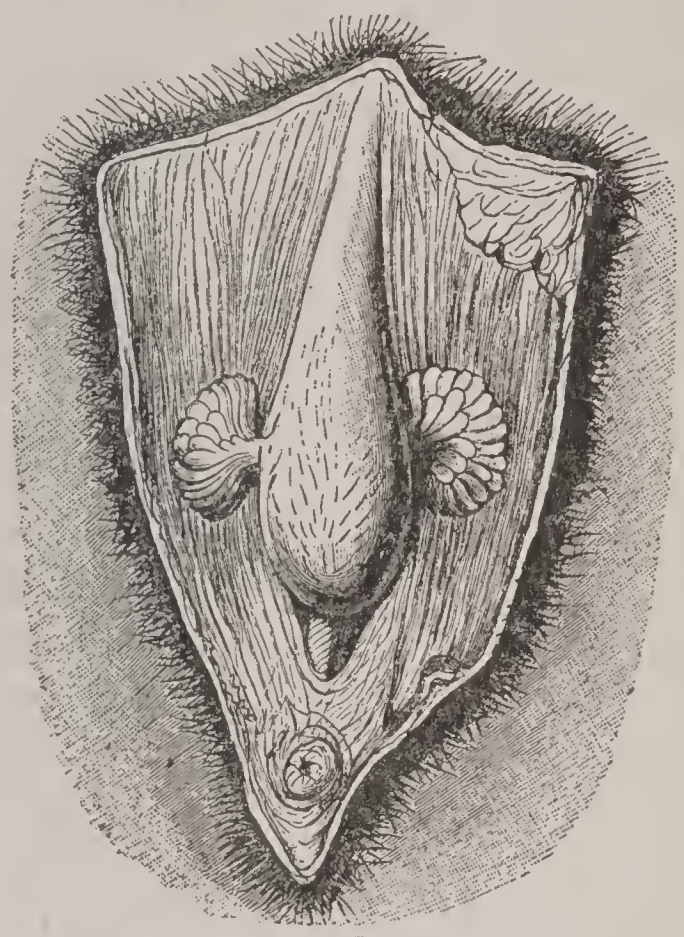
Platinum, a heavy metal of a tin-white color. The name is derived from the Spanish and means silvery. Platinum may be hammered into thin sheets and drawn into slender wire. It is not inclined to unite with other elements but forms alloys with metals readily. It melts only at an exceedingly high temperature—3200° F. Platinum crucibles and spoons are considered indispensable in the chemical laboratory. Platinum occurs in most gold-bearing gravels, but, as it does not amalgamate with mercury, it is difficult to collect. California and Oregon produce small quantities. The world's supply has been derived for centuries chiefly from the Siberian side of the Ural mountains, where it is associated with iron. Colombia exports platinum. Other producers are Brazil, Borneo, Australia, and New Zealand. The market value of platinum has reached above $100 an ounce. Russia used to employ platinum alloy in hardening gold for coinage, but it is now too valuable for that purpose. Platinum pins are used to fasten artificial teeth to the plate, as it is the only metal that will stand the heat of baking. Platium wires are used in electric lamps. Platinum is used in filling teeth, in photography, in jewelry making, in war munitions. An authority writing recently states that the world uses normally 16,591 pounds a year. The Urals produce 10,500 pounds; other regions, 2,000. The use of old platinum makes up the deficit. See DUCTILITY.

Plato, plā′tō (427-347 B. C.), an Athenian philosopher. He came of a scholarly family. He was well educated in grammar, music, and gymnastics. When about twenty years of age he came under the influence of the great teacher, Socrates, and became his favorite pupil and companion. When Socrates was accused of heretical teaching Plato appeared before the judges and offered to pay any fine which might be imposed. He was prostrated by Socrates' death. He wrote a series of dialogues in which Socrates is the leading speaker. The chief of these are the *Apology, Crito,* and *Phaedo.* They are written on a lofty moral plane, unsurpassed outside of Holy Writ. Truthfulness, right living, honesty, justice, kindliness to all creatures, piety, and belief in the immortality of the soul are inculcated in a simplicity of language that approaches the sublime. The Socratic method of leading one's opponent to better understanding of the topic by drawing him out through a series of simple questions is brought out fully in the dialogues. Still other writings, cast also in the form of imaginary dialogues, embody the sentiments of Socrates and the reflections of Plato. Taken as a whole, they mirror the condition of Athenian society four centuries before the Christian era,—love, beauty, law, government, rhetoric, the science of language, psychology, the art of reasoning. His *Republic* in particular has had influence in the shaping of modern political institutions.

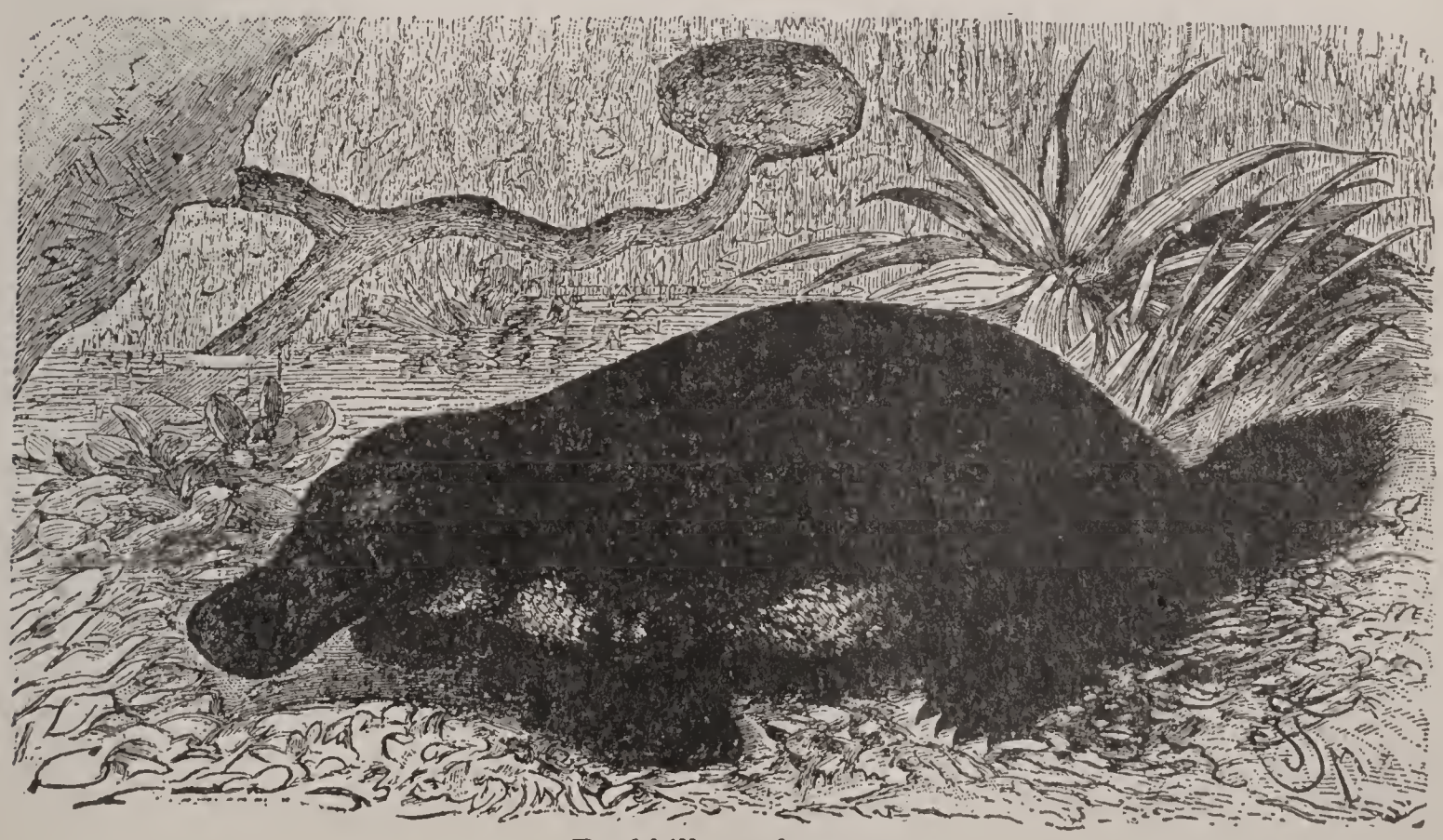
Plattdeutsch, plät′doich, or Low German, the language spoken by the peasantry of the North German Lowlands, from the borders of Holland to Russian Poland. It belongs to the old Saxon group and connects more closely with the English, the Friesian, the Flemish, and the Dutch, than it does with High German. Low German was the language not only of common speech, but of literature as well, and it was not until Luther used High German for his version of the Bible that Plattdeutsch was superseded by a language

Spiny anteater of Australia.

Underside of female showing pouch for young



Inner view of pouch and teats.



Duckbill or platypus.

PLATYPUS AND SPINY ANTEATER.

which gradually became recognized as possessing superior literary merit. By the end of the seventeenth century the use of Plattdeutsch had declined until it was used only as a medium for oral communication. Of late there has been a revival of both literary and philological interest in the language. Among writers, Klaus Grothe and Fritz Reuter figure prominently. As a language, composed of a large number of dialects, Plattdeutsch is today receiving the attention of close philological study. Through these living dialects the progress of the development of the German language can be traced. The *Heliand* (healer or savior) is the oldest extant literary production in the language. It is an alliterative, metrical work, the subject being the *History of the Life of Christ*. It was written by a Saxon monk in 830.

Platypus. See DUCKBILL.

Plautus, a Roman comedian. Born about 254 B. C. His parents were peasants. He appears to have come to Rome to find employment as a stage carpenter. He is credited with 130 comedies. Twenty are still extant. English names for some of his plays are *Pot of Gold, Comedy of Errors, Threepenny Bit, The Carpetbag.* These names are such as would have suited a London audience 2,000 years later. Plautus' *Captivi* is a favorite college classic. A few quotations from Plautus may be of interest:

What is yours is mine.

Patience is the best remedy.

To blow and swallow at the same moment is not easy.

Whom the gods favor dies in youth.

Playgrounds, open play spaces set aside in the larger cities for the use of children who are in need of recreation grounds where they may exercise and play uninterruptedly and under supervision. The demand for playgrounds originated in the overcrowded cities. In London there are playgrounds in connection with every school, and these public parks cover 17,876 acres of ground. The attempt at organization and systematic control of the parks has been left in the hands of the London County Council and the Metropolitan Public Gardens Association. In New York the problem of children playing on the streets is a grave one. In former years a great number of New York's children were arrested and brought into court because they were found to be playing organized games on the streets. On the lower East Side of New York could be seen children playing ball, standing around eating, selling trifles, or caring for babies. But this has now been changed, for New York has arranged for a great number of playgrounds where the children of play age may play undisturbed.

In Chicago in 1915, a $300,000 playground bond issue was voted upon favorably by the voters of the city. Seventy playgrounds were in operation up to October, 1921, when by act of the legislature all playgrounds in the school yards, and those immediately contiguous to a public school, were turned over to the Board of Education, fifty-eight playgrounds being transferred. The total attendance at all of Chicago's playgrounds up to this period (1921), was over 11,000,000, a daily average attendance for each ground of 430 children.

The influence of the public playground has been recognized. In the report of the Russell Sage Foundation the statement is made that "juvenile delinquency" in districts having playgrounds has decreased thirty-nine per cent; other districts have shown an increase. The important features of these playgrounds are: gymnasiums, field-houses, wading pools, libraries, club rooms, and in many places, weekly evening band concerts in the summer. A great deal of attention has been directed to this problem within the last decade.

Playing Cards. See CARDS.

Plebeians, the common people of ancient Rome, as distinguished from the patrician class. They were totally excluded from the patrician tribes, were denied intermarriage with the nobility, and were at first denied all rights of citizenship. The plebeian class kept growing constantly, and they made repeated efforts to obtain the rights and privileges which the nobility enjoyed. Tarquinius Priscus was one of those who favored this step, but his attempt was unsuccessful. Under Servius Tullius they were granted partial governmental control, and he effected further reform by

a division of all the citizens into five classes, grouped according to the amount of property they possessed. Some plebeian families were admitted into the higher orders, for example, into the equestrian order. By the third century the privileges of the two large classes were practically equal. The word "plebs" was then applied to the general mass of the lower people, and for the whole Roman people the word "populus" had come into vogue. See PATRICIANS.

Pleiades, plē′ya-dēz, in Greek mythology, a bevy of nymphs, daughters of Atlas, belonging to the train of the huntress-goddess Artemis (Diana). They were pursued by the giant Orion. In terror they applied for protection to Zeus, who changed them to doves and placed them as a constellation in the sky. There were originally seven of them, but one has disappeared. The story runs that one of the nymphs, Electra, left her place that she might not behold the destruction of Troy, which city was founded by her son, Dardanus. The other stars of the group have been paler since they looked on the awful sight of that city's ruin. The lost Pleiad is alluded to frequently by the poets. The name La Pleiade or the Pleiad is given in literature to several different groups of seven poets living at the same time. One such group is of ancient poets, including Theocritus, Callimachus, and Homer; another is of French poets of the sixteenth century.

Many a night I saw the Pleiades, rising through the mellow shade
Glitter like a swarm of fireflies, tangled in a silver braid.

Pleurisy, in medicine, a disease arising from an inflammation of the pleura or membranous cover of the lungs. It is attended with sharp pains. It appears that a fluid is developed which is favorable to the growth of bacteria. If the system is in order the bacteria are killed and the fluid is absorbed, otherwise the lung cavity may fill, with fatal results.

Pliny, plĭn′ĭ (23-79 A. D.), a Roman naturalist. In the field of natural history Pliny is to Roman scholarship what Aristotle is to Greece. He held various official positions, chiefly military or executive. At the time of the great eruption of Mount Vesuvius he was commander of the Roman fleet in that vicinity, and lost his life in venturing too near. Many of his writings have been lost, but a very interesting treatise on natural history in thirty-seven books remains. It is a sort of encyclopedia of animals and plants, but gives bits of information on every conceivable topic from a test for addled eggs to the nature, cause, and cure of sickness. Farmers were told how to manage animals and how to rotate their crops. His writings give valuable information that would otherwise be lost, and they are interesting as an exhibit of what was known in his day; but Pliny is not altogether trustworthy. He related, for instance, that a dog will not attack a person who promptly sits down; that some people are possessed of an evil eye with the power of killing those on whom they fix their gaze in anger, and that a certain fish in the Mediterranean, though but six inches long, had the power to hold back a ship propelled by 300 oarsmen. All this seems nonsensical now, but it is no more so than a popular notion still held that if a person be bitten by a dog, and the dog should go mad years afterward, the person would go mad also. A nephew, called Pliny the Younger, left a volume of letters valuable for the light they throw on the private life of the Romans. See VESUVIUS.

Pliocene Period, in geology, a name given by Sir Charles Lyell to the most modern of the three periods into which he divided the Tertiary. In Europe, Pliocene rocks occur frequently, though they are not very extensive in America. In the United States, the Merced series of the San Francisco peninsula have a thickness of nearly 6,000 feet, and areas of this nature extend from Virginia to Florida. Similar strata have also been found in Kansas, Texas, Oklahoma, and Oregon.

The life of the Pliocene Period is quite modern, although many extinct species of both plants and animals have been found. In Europe many forms have been discovered that resemble those now existing in Africa. The peccary, horse, mastodon, rhinocerous, llama and sloth inhabited north America at that time. An interesting relic of the Pliocene epoch is a man-like ape, which some anthropologists have

thought might be an ancestral type of man.

Plover, plŭv′er, a family of birds allied to the snipe. The plover has a shorter bill and is less strictly a shore bird. There are a hundred species, of which eight are North American. The noisy, restless killdeer, so called from its shrill cry of *kill-dee, kill dee,* is a familiar bird in the vicinity of ponds. It may be known by a white and a black ring around its neck and a white band and a black band across its breast. The semi-palmated plover or ring-neck frequents salt beaches.

The upland plover is about twelve inches in length. It lives in pastures or on dry prairies, and may be recognized by a trait of holding or stretching its long wings straight up above the back when it lights, "as if to get the wrinkles out before gently folding them."

See SNIPE; SANDPIPER.

Plow, an agricultural implement used for turning over the soil. In all probability the first instrument employed for this purpose was a wooden crotch pulled by hand. The plow may be regarded as having grown out of some such primitive instrument. There were a few plows in Virginia as early as 1617. Plows were introduced into the Massachusetts colony in 1632. Five years later there were less than forty in the entire colony. The colonial plow was made entirely of wood. It required to be heavily weighted to hold it into the ground. At the best it merely stirred the soil without turning a distinct furrow. Few were able to own plows. The fortunate possessor was a man whose friendship was to be cultivated. In some towns bounties were offered to those who would keep a plow for hire to their neighbors. The early French settlers of Illinois used a large, unwieldy, wooden plow, which they improved later by protecting the point with a piece of iron tied on with strips of rawhide. Similar plows are still in use in Mexico and in a number of the South American states.

In 1819 Jethro Wood of New York patented a plow which may be regarded as the forerunner of the implement now in use. It had a cast-iron share, shin, moldboard, and landside. It was constructed according to pattern, so that the share, for instance, would fit any of his plows. From this date onward improvements followed rapidly. John Deering and James Oliver were pioneers in perfecting steel plows that would scour in sticky soils. The sulky plow, on which the plowman rides, and the gang plow, with two or more plows suspended from the same frame, are now familiar. The steam plow, used in England for the first time in 1832. Gang plows drawn by tractors are now common on large farms. Some of these plows used on the great wheat fields have fifty-four shares and will plow an acre in four minutes. Three tractors are required to draw them. Gasoline or oil is used for power. However, smaller gangs that can be operated by one man are more common. With a gang of nine shares one man can plow twelve or more acres a day. The tractor engine consumes about two gallons of gasoline per acre. One man can plow from twelve to twenty acres a day seven inches deep. With a plow of this sort a man is expected to turn over an eighty of wheat stubble between Monday morning and Saturday night, with a half day off to go to town at that. It is a great saving of time and energy.

A favorite French plow is built double—one share and moldboard on the right; the other on the left. The one not in use hangs above the other. By changing the shares at each end of the field the plowman is able to go back in the same furrow without forming lands. A field plowed in this way has neither crown furrows nor dead furrows. In 1836 Daniel Webster, who played at farming in Mansfield, Massachusetts, interested himself in the construction of a plow with a beam twelve feet long which turned a furrow twenty-four inches wide. "When I have hold of the handles of my big plough," said he, "with four pair of cattle to pull it, and hear the roots crack and see the stumps all go under the furrow out of sight, and observe the clear, mellow surface of the plowed land, I feel more enthusiasm over my achievement than comes in my encounters in public life at Washington."

The plow is the emblem of agriculture. It has been adopted as the "coat of arms" of the United States Department of Agriculture.

Plum, a fruit-bearing shrub akin to the peach, almond, and cherry. It is pretty difficult to classify plums. Of native plums we have the common wild plum of the North, the Chickasaw plum of the South, the sand plum of the plains, the beach plum of the Atlantic coast, and the Pacific plum. Of plums introduced we have the apricot plum from China, Japanese plums, cherry plums, and domestic plums from Europe. Prunes are sweet plums that may be dried on the pit without fermentation or souring. Damsons and green gages are well known plum types. As in the case of apples, plum trees are propagated by planting seeds, grafting, and seedlings. Some nurserymen graft plum twigs on peach seedlings. California is our chief plum-producing state. Freedom from insect plagues, with soil and climate unsurpassed, has brought the state forward to a plum production of 13,200,805 bushels in 1920. Much of this crop was dried in the state; the remainder was crated and shipped. Plum blossoms appear in early spring before the leaves. They rival apple blossoms in fragrance. On account of their hardiness, plum trees are raised probably in more dooryards than any other fruit tree. The real way to enjoy plums, however, is to find wild plums in the woods and eat them before going home. See PRUNE.

Plumage. See FEATHERS.

Plumbago. See GRAPHITE.

Plush, a general name given to fabrics of silk, flax, cotton, mohair, or wool woven with a pile deeper and less dense than that of velvet. Plush is used for upholstery purposes, for women's and children's coats, for men's silk hats, for draperies, curtains, and a variety of fancy articles. Plush is woven by means of wires in the same manner as velvet. A specially constructed loom, however, is now in use for weaving mohair plush. This loom produces two webs simultaneously. The two webs are of cotton warps and wefts, while a system of mohair warps is arranged between the two webs and woven into both. As the weaving advances a sharp knife runs between the two webs exactly in the center, separating the two pieces of cloth and leaving the standing pile on each. Plush undergoes careful finishing processes to render the pile lustrous. Mohair plush is one of the most, if not the most, durable fabrics woven. See VELVET.

Plutarch, plu'tark, a Greek writer of prose. He lived during the period of Grecian subjection to Rome, — during the reigns, it is inferred, of Nero to Trajan, inclusive. He is known chiefly for a series of *Lives*. The series consists of forty-six numbers. Each treats of a noted Grecian and of a Roman. Each pair is treated by way of contrast and comparison. A suitable moral points each pair of lives. Among the pairs are the lives of Alexander and Caesar, Demosthenes and Cicero, etc. He wrote the *Lives* in the Greek tongue. He drew his information from a vast number of manuscripts. Most of these manuscripts have been lost. Some authors are known, indeed, only through Plutarch's references. Many facts of Roman and Greek history are known to the historian through the *Lives* only, and many words in Greek lexicons have not been found outside of his writings. Nevertheless his Greek has borrowed too much from the Latin and from Rome, where he resided for a time, to take high rank in literature. As to historical value, fact and fable are mingled inextricably. None the less, Plutarch's *Lives* is an excellent boys' book and a charming volume for the mature student. The first printed edition of the *Lives* appeared at Florence in 1517. So far as ancient history is concerned, the *Lives* are considered "Shakespeare's storehouse." Extensive writings by Plutarch on moral subjects exist, but are little known save to the maker of a Greek lexicon.

Pluto, in classical mythology, the god of the lower world. An earlier Greek title was Hades, the Unseen, still preserved as the name of his dwelling place. By the Romans he was called usually Tartarus, Orcus, or Dis. Pluto means bestower of riches. It was given to this god as the patron of the mines. He was the brother of Zeus. His wife was Persephone, the daughter of Demeter. The Greek conception of the ruler of the dead was very different from the Christian conception of the devil. It was his duty simply to keep order in the lower world. He was in no way the subduer and seducer of mankind. He was

stern and pitiless in the maintenance of discipline, but he was in no sense the enemy of the human race. As in the case of the devil, however, his appropriate color was black. Black cattle were sacrificed in his honor. See DEMETER; HADES.

Plutus, in Greek mythology, the personification of wealth. As he was in the habit of bestowing riches upon the good only, Zeus caused him to become blind, so that his favors might be given to the good and bad indifferently.

Plymouth. See PILGRIMS.

Plymouth, Mass., a manufacturing city and the county seat of Plymouth County, is on Plymouth Harbor, a part of Massachusetts Bay, 37 miles southeast of Boston. It is famed as the first English colony in New England, founded in 1620 by the Pilgrim Fathers. Plymouth is a port of entry, ranking next to Boston in the state. It has a harbor that is nearly land locked, having deep channels that admit large ships. In the harbor are extensive flats on which clams are cultivated for the market. Plymouth is the home of what is probably the largest cordage manufactory in the world, and besides cordage, the city's manufactures include woolen and worsted goods, rugs, mats, insulated wire and other electrical supplies, nails and tacks. The city contains Plymouth Rock, Pilgrim Hall, a museum of Pilgrim and Colonial relics, and a number of other historic sites. In 1920, the population was 13,032.

Plymouth, Pa., an industrial borough, is on the Susquehanna River and the Delaware, Lackawanna & Western Railroad, four miles west of Wilkes-Barre. The greater part of the city's industrial life is dominated by the coal mining and shipping industry, but there are manufactories of mine drills, silk, knit goods and hosiery.

Plymouth has modern schools, a library and attractive public buildings. In 1920 the population was 16,500.

Plymouth Colony, a colony established by the "Pilgrim Fathers" on the coast of Massachusetts in 1620. This was the earliest permanent English colony in New England, the second in America. The site, chosen under stress of weather, was an inlet of Cape Cod Bay, on the shore of what is now Plymouth County, less than fifty miles southeast of Boston. The settlers had a patent from the London Company whose lands lay further south, and found themselves without a government. In this emergency they drew up and signed a compact. John Carver was governor for the first year. The settlers obtained a patent for their lands in 1621. The colony remained an independent republic for seventy years. It never had a charter nor a royal governor. In 1643 Plymouth joined Massachusetts, Connecticut, and New Haven in a colonial union,—the New England Confederation. In 1691 King William granted Massachusetts a new charter, by the terms of which Plymouth became a part of the larger colony. See PILGRIMS.

Pneumatic Tools, industrial implements which are operated by compressed air. They are of two classes; those that strike and those that rotate. The striking tools include hammers, caulkers, riveting machines and rock drills. Drills and other boring devices belong to the rotating class.

Pneumatic (nū-măt'ik) **Tubes,** tubes for the conveyance of letters, telegrams, and parcels by air pressure. They may be of lead, iron or other material, and have an inside diameter varying from one and one-half to eight inches in different systems. Ordinarily, as in a city, the tubes radiate from a central office to outlying districts. The messages are placed in felt-covered gutta-percha cylinders or carriers that fit the pipes closely. A roll of messages is placed in a carrier, it is dropped into a tube, a lever is moved, and the carrier is whisked miles away by a current of air. The currents are usually started centrally.

Pneumonia, a bacterial disease of the lungs. A severe inflammation of the lungs following exposure, together with general exhaustion of the body, affords favorable conditions for the rapid multiplication of bacteria. The bacteria produce a poison. The first symptom is a chill, which is followed rapidly by fever. Once under way an attack of pneumonia cannot be checked before it has had its natural run of ten or eleven days. In the meanwhile the patient needs to keep up strength. The fever may be kept down and the action of the heart stimulated.

Po, the largest river in Italy. It rises in the French Alps and flows in an easterly direction through the wide plains of Lombardy and Venetia. It empties into the Adriatic by several mouths, somewhat south of Venice. It is 360 miles in length and is navigable to Turin. It drains a region of fertility. Turin and Cremona are situated on its banks. Milan, Pavia, Mantua, Parma, and Bologna are situated on tributaries. The Po is subject to overflow in May and June. In 1879, during the rainy season, it rose twenty-one feet. Over $10,000,000 were expended between 1860 and 1880 in constructing levees or dikes to keep the river within its channel and to confine the extra water in reservoirs. These protective works were begun in the day of the Roman Empire, if not indeed earlier. Extensive systems of irrigation are supplied with water from the reservoirs. See DELTA; LEVEE.

Pocahontas (1595-1617), an Indian maiden of Virginia. She was the daughter of Powhatan, a dignified and powerful sachem of the Chickahominy tribe. Romance and fact have been so combined that it is difficult to separate the truth from fiction. In his earlier accounts of the colony of Virginia Captain John Smith states that Pocahontas was kindly disposed toward the starving settlers, using her influence in time of scarcity to induce the Indians to bring in supplies of corn and other much needed food. In 1613 she married John Rolfe, a young Englishman of good character, with whom she visited England. There the valiant Captain Smith began to invest her with a fabric of more or less imaginary circumstance. Her father was an emperor; she was a princess. While exploring the vast forests of the Chickahominy he had been taken captive and brought into the presence of Powhatan. A solemn council having decided that he must die he was made ready for execution. He was bound, his head was laid upon a stone. A powerful brave had raised the fatal war club when Pocahontas, a child of ten or twelve, rushed forward, clasped her arms about his neck, and "hazarded the beating out of her own brains to save mine." This is the story Smith wrote the queen of England in 1616. In 1624 he expounded the tale at greater length in his *Generall Historie.*

Another anecdote, likewise of doubtful authority, runs to the effect that a Captain Argall induced an Indian by the present of a copper kettle to betray Pocahontas into his hands. He held the girl on his ship as a hostage until Powhatan had concluded peace advantageous to the whites and had ransomed his daughter by the surrender of seven captives and the return of three muskets, a saw, an ax, and the gift of a canoe loaded with corn. Nevertheless Pocahontas did not return to her father, but married Rolfe instead.

Returning now to the known facts, Pocahontas was baptized under the Christian name of Rebecca. She was received with distinction at the English court, where a disposition was shown to treat her as a princess, the Lady Rebecca, she was called. She died in England in 1617, "A wild flower in a city."

An association of the descendants of Pocahontas has been formed with headquarters at New York. The membership includes many wealthy and prominent people. John Randolph of Roanoke, the distinguished Virginian, was a descendant of Pocahontas in the seventh generation. In the 1905 balloting for membership in the New York Hall of Fame, Pocahontas Rolfe received sixteen out of a possible 100 votes.

See SMITH, JOHN.

Pocatello, Idaho, the county seat of Bannock County, is situated in southeastern Idaho on the Portneuf River, at the junction of the railroads running from Green River to Portland, and from Butte to Los Angeles. The Union Pacific maintains here a division headquarters with extensive shops and yards.

Pocatello is in a region made fertile by irrigation. It is the commercial center of a mining, agricultural and stock raising region, and has stock yards and meat packing plants. It is the seat of the Idaho Technical Institute, and of St. Joseph's School, and has a good high school, graded public schools, a Carnegie library and handsome municipal buildings. In 1900, Pocatello had a population of only 4,047, while in 1920 the population was 15,001.

Poe, pō, **Edgar Allan** (1809-1849), an American poet. He was born at Boston and died at Baltimore. The Poes were of Irish descent. Edgar's mother was an English actress. Mrs. Poe appears to have remained on the stage. Both Mr. and Mrs. Poe died in Richmond, Virginia, of consumption, within a few weeks of each other. Edgar was adopted by Mr. John Allan, a wealthy merchant of Richmond, whence the Allan in the poet's name. Poe was sent to a dame's school in Richmond. She was accustomed, so runs the story, to hang a carrot around the neck of a bad boy. Edgar put out for home with the carrot dangling from his neck and brought back Mr. Allan who gave the astonished dame a terrible scolding for humiliating his adopted son in such a manner. The Allans made a tour of Great Britain and placed Edgar in school near London. Poe afterward described this school in the story of *William Wilson.* In 1822 Poe returned to the United States and to his home with the Allans in Richmond.

He was a handsome lad with bright eyes, curly hair, and an expressive face. He was a great story teller. Like Byron, he was a strong swimmer. It is related that he once swam from Richmond to Warwick, a distance of seven and one-half miles, against a tide running from two to three miles an hour. In 1826 Poe entered the University of Virginia. It is said that the university was at that time a most dissolute place and that Edgar Poe became one of its most dissipated students, but with high rank, however, in scholarship. Mr. Allan made Poe a liberal allowance, but refused to honor some of the drafts with which the reckless youth had paid his gambling debts. The consequence was a quarrel, Poe quitting the house in a rage.

At this time the Greeks were fighting against the Turks; Byron had died in their service a year or two before. Campbell was writing poetry in their favor, and Halleck in New York had just written his *Marco Bozzaris.* Poe, who was practically running away from home, seems to have tried to reach Greece, but turned up at Petrograd where he got into difficulties with the Russian authorities and might have ended his days in Siberia had not the United States minister interfered in his behalf and sent him back to Mr. Allan at Richmond. Poe's reception cannot have been very cordial. Mr. Allan, however, had him appointed to a cadetship at West Point. Habits of dissipation, neglect of duties, and disobeyed orders soon caused his dismissal, and Poe returned to Richmond. Mr. Allan died soon afterward, leaving a large fortune, but none of it to Poe.

The next authentic item of interest in Poe's life, for no one seems to know just how he earned his bread, though he appears to have enlisted in the army and to have deserted, is his entering into competition for a prize offered by the Baltimore *Saturday Visitor* for the best poem and the best tale. The prize was awarded Poe, and he was requested by one of the committee, Mr. John P. Kennedy, the author of *Horseshoe Robinson,* to call. Poe came with his coat collar turned up to hide the want of a shirt. Cracks in his boots showed that he wore no hose. It is pretty difficult to follow Poe from this time on. He wrote brilliant poems and tales for a number of papers and lived the life of a sot. He married a beautiful girl, but, as might be expected, neglected her. At times he had money and lived well. At times he was in utter destitution. Many tried to stand his friend, and Poe made many efforts to reform but without success.

He tumbled into Baltimore one evening in a drunken condition. Zealous election agents got hold of him and voted him in eleven different precincts. Six days later he died and was buried October 8, 1849, in the burial ground of Westminster Church, Baltimore.

Poe's writings fall naturally into three groups—critical writings, poems, and tales. As a critic of books and of writers of books he showed intelligence and discrimination, and was influential in throwing into disrepute the romance of exaggerated sentimentality. His work in this line, however, is no longer of interest to the general reader. His best known poems are *The Raven, The Bells, Annabel Lee, Lenore,* and *Israfel.* As a writer of short stories Poe must be ranked among the masters. In invention, in keen analysis of sensitive and morbid natures, in the power of vis-

ualizing the unreal, and in fine execution of details, Poe cannot be surpassed. His stories are, however, weird and full of horrors. They are therefore less pleasant reading than those which depict everyday life and ordinary human beings. Among the best known are: *The Gold Bug, The Fall of the House of Usher, The Murders in the Rue Morgue,* and *The Domain of Arnheim.*

Poet Laureate, pō′ĕt law′rē-āt, a poet appointed by the sovereign of England to be in readiness to celebrate notable events. The position is largely honorary, although there is a salary of $1,800 to go with it. Ben Jonson was appointed in the reign of James I. If we omit the names of those unknown to fame, the position has been occupied by Jonson, Dryden, Southey, Wordsworth, and Tennyson. Robert Bridges is the present incumbent (1915).

Poetry, as commonly used, the expression in rhythmical and metrical form of ideal and imaginative thought touched by emotion. The giving of an accurate and satisfactory definition of the word poetry involves the consideration, not only of the subject matter in its relation to both poet and reader, but also of what constitutes artistic expression as regards choice of words and figures and metrical form. Macaulay in his *Essay on Milton* defines poetry as the "art of doing by means of words what the painter does by means of colors." According to this definition, metrical form is not necessary to true poetry; and, when we regard its effect upon us, such prose as the *Book of Ruth,* the *Song of Solomon, Pilgrim's Progress,* certain passages in Longfellow's *Kavanaugh* and in the writings of Ruskin, of Emerson, of Dickens, of Hawthorne, are, in fact, poetry. In the common use of the term, however, poetry possesses both meter and rhythm. Ruskin defines it as "the suggestion by the imagination, in musical words, of noble grounds for noble emotions,—love, veneration, admiration, and joy, with their opposites."

It is an interesting fact that among all peoples poetry has been the earliest form of literature. It is the natural and spontaneous expression of exalted emotion. Prose is the expression of calmer thought. It is from the intellect. Poetry comes from the heart. As regards the nature of the feeling and thought expressed, poetry may be classed as lyric, epic and dramatic. Lyric poetry is distinctively the poetry of emotion, of song; epic, the poetry of narration; and dramatic, the poetry of action, the poetry of the stage. The following classification may prove convenient:

I. Lyric.
  1. Song.
  2. Anthem.
  3. Hymn.
  4. Elegy.
  5. Sonnet.
  6. Ode.

II. Epic.
  1. Great Epic.
    a. National.
    b. Artistic.
  2. Lesser Epic.
    a. Metrical Romance or Tale.
    b. Ballad.
    c. Pastoral.
    d. Idyll.

III. Dramatic.
  1. Tragedy.
  2. Comedy.

IV. Didactic Poetry.

V. Satirical Poetry.

Didactic and satirical poetry are lower forms involving little imagination or emotion. They are addressed to the intellect or reason, rather than to the feelings. Didactic poetry aims to give instruction, as Pope's *Essay on Man.* Satirical poetry aims to expose evils and to work reforms, political or social. Butler's *Hudibras* and Lowell's *Biglow Papers* belong to this class.

Two or more forms of poetry are united frequently in some one production. Spenser's *Faerie Queene,* though epic in character, is also didactic. Many epics and dramas contain lyrical passages. There are, moreover, many poems which cannot be placed under any one of the subdivisions, since they lack the specific features necessary to make them assignable to any particular class. Hood's *Song of a Shirt* and Burns' *To a Mountain Daisy* are examples of lyrics which can not be classed readily.

Versification or prosody is concerned with the form or structure of poetry, the meter and rhythm. Rhythm is the recurrence of accented and unaccented syllables. Theoretically all spoken language has rhythm. Practically prose is said to possess

rhythm if the arrangement of accented syllables is such as to be noticeable and to fall pleasingly upon the ear. For instance, in the following passage from Dickens, we find rhythm.

Then up rose Mrs. Cratchit, Cratchit's wife, dressed out but poorly in a twice-turned gown, but brave in ribbons, which are cheap, and make a goodly show for sixpence.

Should we change it to read:

Cratchit's wife, Mrs. Cratchit, poorly dressed in a gown which she had turned twice, but with ribbons on it, which are cheap and make a good show for a sixpence, rose up.

The rhythmical effect is largely lost. In the following description of a snowstorm from Longfellow's *Kavanaugh,* the rhythm is very evident.

The first snow came. How beautiful it was falling so silently, all day long, all night long, on the mountains, on the meadows, on the roofs of the living, on the graves of the dead! All white save the river that marked its course by a winding black line across the landscape, and the leafless trees that against the leaden sky now revealed more clearly the wonderful beauty and intricacy of their branches!

What silence, too, came with the snow and what seclusion! Every sound was muffled, every noise changed to something soft and musical. No more trampling hoofs, no more rattling wheels! Only the chiming sleighbells beating as swift and merrily as the hearts of children.

In poetry the accent or stress recurs at regular intervals. Meter means measure, and a metrical production is one in which the rhythm is measured off; that is, the syllables are grouped, each group containing one accented syllable, and one or more unaccented syllables. Such a group is called a foot. A line, or speaking properly, a verse, contains from one to eight feet. The verses are grouped usually into stanzas.

In English verse the meter is determined by the number of feet, from one to eight, in a line. The varieties of meter are designated by the names of the Greek numerals. Monometer has one foot to a line; dimeter, two; trimeter, three; tetrameter, four; pentameter, five; hexameter, six; heptameter, seven; octometer, eight. The rhythm is determined by the kind of foot. A foot consists usually of either two or three syllables. Of two syllables or dissyllabic feet, the most important are the *iamb* or *iambus* and the *trochee.* The iambus consists of an unaccented syllable followed by an accented syllable. It is the most common foot in English poetry.

Mine eyes'| have seen'| the glo'| ry of'| the com'| ing of'| the Lord'.

The rhythm of this line is iambic. As there are seven feet, the meter is heptameter, or, as usually expressed, the meter is iambic heptameter.

An hon'| est ma'n's| the no'| blest wo'rk| of Go'd.

is iambic pentameter. This meter is used by Shakespeare and many of the Elizabethan poets. Nearly all of Pope's poems are in this meter. It is called often the heroic measure. A verse of six iambic feet, also a much used measure, is called the Alexandrine measure.

While sad'| Night o'| ver him'| her man'| tle black'| doth spread'.

The trochee is a dissyllabic foot in which the first syllable receives the accent.

Then' up | on' one | knee' up | ris'ing
Hi'a | wa'tha | aimed' an | ar'row

is trochaic tetrameter. A three syllabled or trisyllabic foot, consisting of an accented syllable followed by two unaccented syllables, is called a dactyll.

This' is the | for'est pri | me'val: the | mur'muring | pines' and the | hem'locks

is a verse in dactyllic hexameter. Virgil's *Aeneid* is in this measure. A trisyllabic foot, consisting of two unaccented syllables followed by one accented syllable, is an anapest.

For the moon'| never beams'| without bring'| ing me dreams
Of the beau'| tiful An'| nabel Lee'.

Here we have in the first line anapestic tetrameter and in the second anapestic trimeter. Often a verse contains more than one kind of foot, in which case it is named from the prevailing foot. An unaccented syllable is sometimes omitted, leaving a foot incomplete, a pause taking the place of the missing syllable. This occurs more often at the end of a verse. Pauses occur in poetry as they do in prose, the sense suggesting the pause. The most important pause coming in the body of a line is called the *caesura.* The caesura is not essential, but is common, especially in long lines.

Rhyme, while of common occurrence in poetry, is not essential. In lyric poetry, it is almost universal. Rhyme consists of a correspondence in the sound of words. The rhyming words are usually the terminals of lines, although rhyme may occur within a line. In Shelley's *The Cloud,* we have both forms of rhyme, as

That orbéd *maiden* with white fire *laden,*
Whom mortals call the *moon,*
Glides glimmering *o'er my* fleece-like *floor*
By the midnight breezes *strewn.*

The indention of lines of poetry is of importance. In unrhymed poetry the lines all stand on the same margin. When rhymes occur, the lines which rhyme stand in the same margin provided they are of the same length.

Oft, in the stilly night
Ere Slumber's chain has bound me,
Fond Memory brings the light
Of other days around me;
The smiles, the tears,
Of boyhood's years,
The words of love then spoken;
The eyes that shone
Now dimm'd and gone,
The cheerful hearts now broken.

In the foregoing stanza of Moore's well known song we notice that the first and third lines stand on the same margin, the second and fourth, the fifth and sixth. In the remaining four lines also, the first and fourth, and the second and third, are similarly indented. In stanzas of irregular meter the length of line is considered in arrangement. In regular stanzas the rhyme decides the indention.

No two critics would agree probably in making a list of the greatest English poems. Young people desiring to form a taste for poetry, however, can not go amiss in the following list:

The Cloud .....Shelley
The Lady of the Lake .....Scott
Elegy .....Gray
Evangeline .....Longfellow
Snowbound ..... Whittier
Locksley Hall .....Tennyson
The Vision of Sir Launfal.....Lowell
Intimations of Immortality.....Wordsworth
The Song of the Chattahoochee.....Lanier
The Ancient Mariner .....Coleridge
Thanatopsis .....Bryant
The Chambered Nautilus .....Holmes

Poet's Corner. See WESTMINSTER ABBEY.

Poincaré, pwan'-ka-ra, **Raymond** (1860-), a French statesman and diplomat. His family is a famous one, Henri, the celebrated mathematician being a cousin. Raymond received a collegiate education, studied law, and soon thereafter became interested in politics. He held a number of offices, among them being Minister of Education, Minister of Finance, Vice-President of the Chamber of Deputies, and member of the Senate. He was called to the premiership by President Fallières and so distinguished himself in the Moroccan affair, the re-organization of the finances and of the army that he was elected President of the Republic on the Conservative ticket in 1913. His skill as an executive was severely tried in the European War of 1914 but he was equal to the task and acquitted himself with credit. President Poincaré was honored with election to membership in the French Academy in 1910.

Pointer. See DOG.

Poison, any substance that, if introduced into the system, tends to impair health or cause death. The term is difficult to define. Even water, the most wholesome of substances, may, if injected into a vein, destroy the blood cells and cause death. Then, too, quantity is a factor. A small dose may be helpful; a large dose, death. Even strychnine may be administered in minute quantities as a remedy for paralysis and dyspepsia. Another fact is well expressed by the popular saying, "What is one man's meat is another man's poison." An old-fashioned classification serves the present purpose:

CORROSIVES. These poisons, like lye, eat away the lining of the throat, stomach, and intestines. Corrosive sublimate or soluble chloride of mercury is of this type. Makers of looking-glasses, thermometers, barometers and the like, in which mercury is employed for backing, are especially subject to mercurial poisoning. The acids known as sulphuric, nitric, hydrochloric, oxalic, and carbolic, as well as some of the alkalies, are of this type. The only remedy is washing out the stomach. Ptomaine belongs here. As to remedies it may be said in general that an acid is an antidote for an alkali and an alkali an antidote for an acid.

IRRITANTS. These are poisons that cause

inflammation, especially of the swallow, stomach, and parts of the alimentary canal. Arsenic, lead, copper, zinc, and phosphorus are leading poisons of this class. Paris green is an arsenical poison. Many a child has been poisoned by the phosphorus found in the heads of matches. The bite of a rattlesnake belongs to this class. Many of the gases, as coal gas, are irritant and highly poisonous. Alcohol and nicotine belong to this division.

Nerve-Destroying Poisons. Prominent poisons of this sort are prussic acid, opium, strychnine, aconite, and belladonna.

In case of poisoning, the physician with his stomach pump should be summoned in all haste. In the meantime a drink of hot water, all the better if strong with mustard, may induce vomiting. The emetic will be aided in doing its work if the patient lie face downward with the head hanging over the edge of the bed and if the inside of the throat be tickled with a feather. For some of the more common poisons, the remedies most likely to be at hand are:

Acids.—Muriatic, oxalic, acetic, sulphuric, nitric. Antidotes: Soapsuds, magnesia, limewater.

Carbolic Acid.—Antidotes: Flour and water, mucilaginous drinks.

Prussic Acid.—Antidote: Ammonia in water.

Alkalies.—Lye, potash, hartshorn, ammonia. Antidotes: Vinegar, lemon juice in water.

Arsenic.—Rat poison, Paris green. Antidotes: Milk, raw eggs, sweet oil, lime-water, flour and water.

Bug Poison.—Corrosive sublimate, blue vitriol, sugar of lead, saltpetre, lead. Antidotes: Whites of eggs or milk in large doses.

Chloroform.—Remedy: Artificial breathing and a dash of cold water on the face.

Carbonate of Soda.—Copperas, cobalt. Antidote: Soapsuds.

Iodine.—Antimony. Antidotes: Starch and water, strong tea.

Mercury.—Antidotes: Whites of eggs, milk, mucilages.

Opium.—Morphine, laudanum, paregoric, soothing powders or soothing syrups. Antidotes: Strong coffee, hot bath. Keep awake and keep moving at any cost.

Charcoal has a power of absorbing poisons. Powdered charcoal stirred in water and taken in quantity is a harmless remedy for many poisons.

Poison Ivy, or **Poison Oak,** a poisonous plant of the sumac family. It is a low, erect shrub, or else climbing by rootlets over stumps and stones ascending trees. The poison effect is ascribed to a native oil. It is most virulent at the flowering season. There is a theory that this inflammation is due not to the acrid juice of the plant, but to certain parasitic plant germs that reside on the plant. If this theory be true, these germs must fly in the air, for at certain seasons a person working amid poison ivy or passing to leeward of a swamp of sumac is likely to be affected by a painful inflammation of the face, even though there be no actual contact. The poison ivy may be known from the American ivy, an unrelated and harmless climber, for the former has leaflets in threes and white berries, while the latter has leaflets in fives and has bluish black berries. This distinction, and the fact that poison sumac has white berries and not the red berries like its harmless relative, may be held in mind by a clever jingle perpetrated by Gibson:

Berries red,
Have no dread!
Berries white,
Poisonous sight!
Leaves three,
Quickly flee!

Poland, Republic of, a state of central Europe, was formed after the World War from parts of the kingdom that was dismembered in the eighteenth century by Russia, Prussia and Austria. As nearly as can be estimated, considering the chaotic condition of central Europe (1923), the area of the state is 124,097 square miles. The boundaries are: Germany, Latvia and Lithuania on the north; Russia and Ukrainia on the east; Rumania and Czecho-Slovakia on the south; and Germany on the west. The Carpathian Mountains form the natural southern boundary.

The People. The census of 1921 gives the population as 26,376,106. Of this total the greater portion are Poles—about 18,000,000. The next largest element, 3,000,000, is Jewish; and the remainder of the population is made up of Ruthenians, Lithuanians, Germans and Russians. The capital and metropolis is Warsaw, which at the last census had 931,176 inhabitants. Three other cities have more than 200,000 residents, and a total of 50 Polish cities have populations in excess of 25,000.

MINERALS. The most important mineral is petroleum; this is mined in Galicia. In 1921 Poland was the eighth petroleum producing country of the world, with an output of 3,665,000 barrels. Coal, which is mined principally in Silesia, is next in point of value. Since the close of the World War the annual production has been about 6,000,000 tons, but the figure would be larger were the state more stable economically. Potassium salts, zinc and iron are the only other minerals that have a commercial value.

AGRICULTURE is the principal industry; more than 61,000,000 acres are in farms, and about 51 per cent of the people are engaged in farming. The pastures of the state comprise 13,000,000 acres, and more than 32,000 square miles are forested.

In bushels, the potato crop is largest. Wheat, rye, oats and sugar beets are raised in large quantities, and clover seed, small fruits and vegetables are raised in quantities about sufficient for local needs.

The principal stands of timber are pine, fir, spruce, larch, elm, oak, ash, aspen, birch and alder.

Cattle, swine, horses and sheep, in that numerical order, are raised, and wool and dressed meats are important items in the national economy.

INDUSTRY AND COMMERCE. Poland has 2,000 distilleries and more than 400 breweries, and produces, in an average year, a total of about 115,000,000 gallons of alcoholic beverages. The cotton and woolen goods industries are important, and the metallurgical industries are valuable. Leather goods, potato starch and boots and shoes are produced in large quantities.

The trade of Poland, which is not voluminous, is chiefly with Russia. Textiles, boots, clothing, horses and farm produce are the leading exports, and the imports are raw wool and cotton, iron ore, pig iron, cattle and flour.

TRANSPORTATION. The latest estimate gives 7,295 as Poland's railroad mileage. The principal waterway is the Vistula River, though navigation on this stream in Poland is impossible for large vessels. The Niemen is navigable for a little distance. The Pilitsa, Dniester, Bug and Oder are also in part navigable, and there are a number of good canals.

EDUCATION. Elementary education in the new Poland is free and compulsory, and the latest figure for elementary school attendance is 2,000,000 children. The state has about 450 secondary schools, more than 1,400 technical schools, two academies of commerce, an academy of science, a school of mines and five universities. The school system has not (1923) yet been unified, but effort toward unification is being made.

GOVERNMENT. The republic is governed under a constitution adopted on March 17, 1921; this instrument embodies a number of the best features of the French and American constitutions and provides for a President elected by the national assembly for a term of seven years, and for a cabinet responsible to the legislature. Absolute religious freedom obtains—though Roman Catholicism is predominant—and each citizen of the state may speak his own language.

HISTORY. The Poles are a Slavish people whose history, though it goes back in legend as far as the third or fourth century, really begins in the tenth century, when Mieczyslaw (962-992) ascended the throne and accepted Christianity. He was succeeded by his son Boleslaw (Boleslas), surnamed The Brave; under this monarch Poland became an independent kingdom, and though frequently at war, the kingdom throve until the Mongol invasion of 1240. At this time the country suffered severely, and after the war the state was divided into a number of principalities, the quarrels of whose petty rulers caused the loss of much territory.

It was during this period of dissension that those foreigners—mostly Germans—who were to dominate Poland in the future, made their appearance in the country. The king known as Ladislas I reunited Poland in the fourteenth century, and under Casimir the Great, successor of Ladislas, the state rapidly advanced in prosperity and importance. Louis of Hungary, the nephew of Casimir, was the next ruler, and in 1384 Louis' daughter, Hedwig, became queen of Poland. She married Jagello, a prince of Lithuania, and thus

founded the dynasty under which Poland reached its greatest height. The last of the Jagellons died without heir in 1572.

After that date the kings of Poland were elected; but owing to the enmity between the inferior and chief nobles, and the greater influence of the latter, it was usual to elect to the throne a member of some foreign noble family. From time to time a Pole was elected to the throne; one of the most famous of these was John Sobieski (See JOHN III).

THE THREE PARTITIONS. The policy of granting power to foreign nobles and capitalists that the Polish nobility had adopted was the prime cause of the three divisions to which Poland was subjected. The first was the act—deliberately planned—of Catherine II of Russia and Frederick the Great. An unpopular Polish nobleman was chosen king, and during the ensuing anarchy, under the guise of intervention, Catherine and Frederick each appropriated —or stole—a large piece of Polish territory, in 1772.

It was after the beginning of the French Revolution that the second partition took place. Poniatowski, the unpopular king of Poland, atempted to revise the constitution and make of his country a strong state. This alarmed Catherine, who intervened on behalf of the Polish nobility and again appropriated some territory. William II of Prussia also accepted the opportunity to enlarge his domains at the expense of his weak neighbor.

In 1795 the third and greatest crime against Poland was committed. The noted Polish patriot Kosciusko led a revolt against those who proposed the third division; but as the king would not aid him, the forces of Austria, Prussia and Russia invaded Poland, each taking such territory as it could and wiping out Poland as a separate state. Each of the three countries held parts of Poland until the opening of the World War.

Poland was invaded by Austrian and German armies in 1914; these forces were opposed by the Russians, who promised the Poles independence if they would aid in the opposition. Von Hindenberg took Warsaw in the summer of 1915; the Russians were driven from the country, but as they retreated they burned and wrecked in order that nothing would remain for the support of the invaders. In 1916 the emperors of Germany and Austria issued a manifesto proclaiming the independence of Poland, but the boundaries and constitution of the state were not defined. In the same year a council of state, consisting of 25 Poles, met for the purpose of drafting a constitution, but their efforts came to naught. In October, 1918, a constituent assembly was organized, and in November the independence of Poland was proclaimed. The new state was recognized at the time of the drawing of the Versailles Treaty, 1919, and in 1921 the constitution was adopted. Poland has been admitted to the League of Nations (which see), and the future of the state depends largely upon the question of economic rehabilitation.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, squares miles	124,097
Forest area, square miles	32,171
Population (1921)	26,376,106
Chief Cities:	
Warsaw	931,176
Lodz	451,813
Lemburg	206,113
Vilna	205,000
Cracow	176,463
Posen	156,691
Sosnowiec	86,452
Number of counties	15
Members of national assembly	120
National revenue	$33,000,000,000
Bonded indebtedness	$75,000,000,000
Farm area, acres	61,768,000
Wheat, bushels	35,576,000
Rye, bushels	167,215,000
Oats, bushels	149,778,000
Potatoes, bushels	567,083,000
Sugar Beets, short tons	188,493
Domestic Animals:	
Horses	2,847,000
Cattle	6,918,000
Sheep	2,389,000
Swine	5,185,000
Sugar, tons	168,000
Iron and steel, tons	16,180
Coal, tons	6,408,664
Brown coal, tons	251,822
Potassium salts, tons	37,000
Imports, tons	3,529,810
Exports, tons	611,315
Miles of railway	7,295
Number of public schools	7,156
Pupils enrolled	2,000,000

Polarization, a term used in physics in several different senses. For instance, in a simple cell, when the hydrogen liberated has collected on the positive electrode till the current ceases, the cell is said to be polarized. This is due to the resistance offered by the hydrogen and also to the counter-electromotive force set up.

In light, the word polarization is used to describe the condition of a beam in which the vibrations are confined within certain planes or paths. If a beam, with its vibrations all at right angles to the direction of propagation, is reflected at the proper angle from a glass surface, the reflected beam will be found to have its vibration in but one plane, or if sent through certain transparent crystals as tourmaline, the emergent light is similarly polarized. Plane polarized light such as this now is, cannot pass through a tourmaline at right angles to the first, nor can it be reflected from a mirror at the proper angle. The light is wholly quenched. Polarization is one of the chief phenomena upon which is based the theory of the transverse vibration of light. A practical application of polarization is made in determinations of the strength and purity of sugar solutions by the degree through which the plane of polarization is rotated.

Polecat. See SKUNK.

Polestar, or **Polaris,** or **North Star,** a prominent star in the northern heavens. It is so called because it is almost directly above the north pole. To an observer on the equator the polestar lies in the horizon. As one advances northward, its position becomes higher and higher. At the north pole it is overhead. It is not visible to observers living in the southern hemisphere. For people in the northern hemisphere, the polestar is the one star that does not change position. Most stars rise in the east, pass over through an arc, and set in the west. The stars inside of a large circle, supposing one lives in the north temperate zone, seem to wheel about the polestar once every twenty-four hours in a direction contrary to the hands of a watch; but, night or day, the polestar is the one heavenly body that remains in the same identical position—due north. As a matter of astronomical exactness the pole of the heavens, or point through which the line of the earth's axis passes, is changing, wandering around the circumference of a small circle. In about 5,600 years this point will be near another star, but for the present we may regard the polestar as due north. Before the day of the mariner's compass, sailors out of sight of land were sure of their course only at night, when they could see the polestar. Wind, sun, moon, and constellations shifted; the polestar was the one unchanging guide. Hence such poetical allusions as the polestar of one's hopes. Even now the navigator and surveyor are sure of their compasses only when they have opportunity to test them by the north star. The polestar may be found readily by following the line of the pointers in the Great Bear, or Big Dipper. It should be remembered that the Big Dipper seems to revolve about the polestar and may be in any apparent direction from it. See ARCTIC REGIONS.

Police, a body organized for the maintenance of the public peace and security, and the protection of public health and morals.

France is believed to have established the first police force, and she was followed by England in 1828, after the celebrated Peel Act was passed. The first American force was established in New York City in 1841, composed of two constables in each of the 17 wards, 300 night watchmen, 100 marshals, 100 wardens and miscellaneous officials. The various states gradually separated their judicial from their police magistracy, until at the close of the nineteenth century the institution in America was an established fact.

In the United States a new form of police power, known as the state police, or sometimes as the constabulary, has been inaugurated. The members of this department are appointed by the governor and his council, and are as a general thing former members of the United States army, navy, or militia. Their duty in the main is to pursue criminals from one state to another and to guard certain country roads made dangerous to public safety since the introduction of the automobile. In some localities they act as fish and game wardens and as fire marshals. Many states restrict their authority. Usually they are not permitted

to suppress riots with out orders from the governor.

Pennsylvania has the largest state police force in the United States, and Massachusetts, Texas, Connecticut, Pennsylvania, Nevada, New York, South Dakota, Michigan, Idaho, New Mexico, Tennessee, West Virginia and Illinois also are represented.

Political Economy. See ECONOMICS.

Political Parties are regular and standing organizations of voters found today in all countries where the government is not an absolute despotism. In all free countries, like the United States, England, or France, these organizations play so large a part that we speak properly of the government as "carried on by parties." This, however, is a very modern condition. If we pass by the irregular factional strife of the old Roman and Greek cities and of the medieval Italian cities (which resembled civil war rather than party government), then we may say that the history of *party organization* begins in England in the seventeenth century. But *government by these organizations* in England does not appear in the full sense of the phrase until about 1830,—some forty years after that system had arisen in the United States.

James I ascended the English throne in 1603. Almost immediately there began a struggle in Parliament between the advocates of greater popular liberty (known sometimes as the Country party) and the adherents of the monarch (or the Court party). This struggle lasted forty years before it merged into the great civil war between Parliament and king that resulted in the Commonwealth of 1649-1660. The division, however, did not result at any time during all that period in definite *organizations* with specific platforms. It was vague, changing, irregular. Almost at the close of the period, it is true, something more promised for a moment. In 1642, in the third year of the Long Parliament, Pym and the radical members of the Country party, after a long and bitter all-night debate, carried the famous "Pym Remonstrance,"—which was really an appeal to the country to support them in a definite program for taking from the king certain of his old powers. Upon this issue England might easily have divided into two true parties; but civil war came instead. The contest became one of armies, not parties; and party organization was postponed nearly forty years more. After the Restoration, in the latter part of the reign of Charles II, the more radical members of Parliament tried to pass a bill to exclude from the succession to the throne the king's brother and nearest heir, James, Duke of York. The contest raged in Parliament for many months, and spread over the whole country. The adherents of the bill were known as "Exclusionists," and monster petitions were sent up by their sympathizers in all parts of England to support their program. These "Petitioners," or "Exclusionists," were necessarily somewhat radical in political thought, since their program was in itself a denial of the divine right theory of kingship. The Catholics and conservative political factions sent up counter petitions expressing their "horror" at the proposal. These people became known as "Abhorrers."

This division marks the beginning of continuous party organization in England. The radical petitioners were called Whigs (whey-eaters) by their enemies, after a term that had been applied disrespectfully to the extreme Scotch Calvinists. The conservative "Abhorrers" were called "Tories" (bog-trotters), after a contumelious name applied to the Irish rebels (since that element now supported the royal and Catholic policy). These names were soon adopted as titles of honor, and they continued in general use for a hundred and fifty years, before they were replaced by the more aptly descriptive names, "Liberals" and "Conservatives," by which the leading English parties are still known. Until about the time of this change of name, however,—that is, until about 1830,—the parties on the whole were used by the government (by the king or by his ministers) to make the political machinery run smoothly. But after the Parliamentary Reform Bill of 1832, the House of Commons became clearly the real sovereign in England, and since that time the government has been "carried on by parties."

The original division in the times of Charles II, had not been wholly determined by inclination to royal or to parliamentary

government. Religious connection had obscured this fundamental distinction to some degree. Nearly all Catholics, however liberal in other matters, "abhorred" the exclusion of the Catholic heir; and nearly all Scotch Presbyterians and English dissenters, however conservative on other questions, petitioned for that exclusion. Once organized, the make-up of each party continued largely a matter of tradition and inheritance. The great families who led the fight against the Duke of York and against James II, continued to dominate "Whig" politics for generations, although they were really no more liberal than the general run of their Tory opponents.

Such complications and obscurations of fundamental principles make the great weakness of party government. The more nearly party divisions correspond to real distinctions in the human mind and character, the more wholesome party government will be. On the whole, with all these original drawbacks, and with many later ones, the division in England has corresponded to such fundamental differences in human character, more nearly perhaps, than has been the case in any other country.

These distinctions in human character and the political divisions based upon them are admirably stated in a famous passage (condensed below) by the historian Lecky:

> One man has more caution; another more confidence. One looks with reverence upon the past; the other sees brilliant vistas in the future. One perceives most clearly the advantages of existing institutions and the possible dangers of change; while the other sees most keenly the defects of existing institutions and the possible additions to well-being. In all large bodies of men these differences find expression in party divisions. The one side rests chiefly on the great truth that one of the first conditions of good government is essential stability, and on the danger of perpetually tampering with the main pillars of the state. The other side rests chiefly upon the no less certain truth that a government is organic, capable of growing, expanding, and adapting itself to new conditions of society. The one side represents the static, the other the dynamic element in politics. Each can claim a natural affinity to some of the *highest qualities* of character; and each owes quite as much of its strength to *mental and moral disease*. Stupidity is naturally Tory. Folly is naturally Liberal. The large classes blindly wedded to routine and simply incapable of understanding new ideas or the exigencies of changed conditions, find their place in the Tory ranks. To the Liberals belongs the cast of mind, which, without sense of the infinite complexity of political problems or of the part which habit and tradition play in every healthy political organism is ready, with light heart and reckless hand, to recast the whole structure of the Constitution in the interest of experiment.

In tone somewhat similar to this closing thought of Lecky's, Colonel Higginson writes of the division into parties in our country in Washington's day: "Some men became Federalists because they were high-minded, and some because they were narrow-minded; while the more far-seeing and also the less scrupulous became Republicans." In other words, when the young man chooses his party, he must expect it to have "the defects of its virtues," and not be repelled unduly by the manifestations of those defects.

In the United States, real political parties appear toward the close of Washington's first administration, about 1793. The earlier divisions in individual colonies between class and class or between proprietary interests and popular interests had not been true parties. The discussions over parliamentary taxation between 1765 and 1775 promised a division into national parties, but the embryo organizations were lost in the war for independence. After that struggle was over, in some individual states there were temporary divisions over such questions as paper money, but the lines of division had no permanence. In the convention at Philadelphia which framed our Constitution there seems to have been absolutely no suspicion on the part of anyone that the government then devised was to be run by parties. The debates refer in great detail and with incessant repetition to the desirability of all sorts of checks and balances; but the real balance (between parties) which was to mark the new instrument of government was never even suggested. It is one of the marvels of history that a plan of government should have worked so well with a motive force wholly unthought of by the designers,—somewhat as if an engine designed for steam had been found to run better by electricity. The Fathers, so far as they dreamed at all of the possibility of regular party organization, feared and abhorred it. John Adams wrote in 1790: "There is nothing I dread so much as a division of the Republic into

two great parties, each arranged under its leader, and concerting measures in opposition to each other. This, in my humble apprehension, is to be dreaded as the greatest political evil under our constitution." Indeed, up to that time, Burke in England was the only thinker who had even dimly foreseen and tried to state the function of parties, and he had been railed at for his insight.

When the Philadelphia Convention adjourned, national parties did appear for the adoption or rejection of the proposed constitution. But the division between Federalists and Anti-Federalists disappeared with the ratification of that instrument, and no American thinker seems to have suspected a revival of such parties as regular organizations.

When Washington became president there were no parties; but there were certain divergent interests and sympathies in American society which were soon to give rise to parties. The commercial interests (strongest in New England) wished close relations with our best customer, England. Consequently, the commercial classes inclined toward the aristocratic and conservative principles then popular in England, and took strong ground against the radical democracy of revolutionary France with which England was at war. Moreover, in order that the government might make advantageous commercial treaties and effectively protect commerce, this same group of interests was favorable to assumption of all doubtful powers by the central government, —that is, to a "loose construction" of the Constitution.

These aristocratic, commercial, loose-constructionist elements found themselves in possession of the government, and called themselves Federalists,—after the party which had established that government. In opposition to this party Jefferson succeeded in organizing the democratic agricultural interests, fearful of a strong central government and inclined therefore to a "strict construction" of the Constitution. This new party first appears in 1792. It had no name at first, and, being in opposition to the Federalists, it is sometimes called Anti-Federalist; but there is no connection in organization, make-up, or principle, between the new opposition party and the Anti-Federalists of 1787-88, and the name is an unfortunate misnomer. Jefferson from the first called the new party "Republican," and by that name it soon came to be known. Fairly continuous party organization in America dates from these divisions of 1792-1793 (for the brief "era of good feeling" can hardly be said to invalidate this statement). It was only by slow degrees, however, that even Jefferson recognized that such divisions as he had helped to create were to be permanent.

Jefferson seems to have believed that his opponents (Hamilton and Adams) wished a monarchy. He makes the statement frequently, and, many years later, referring to this original party division, he says: "The contests of that day were contests of principle between the adherents of republican and of kingly government." Allowing for much error and exaggeration in such statements, it remains true that the party division of that early period was more nearly the wholesome one between conservatives and radicals than has been the case at any subsequent time in our history. This natural division has been unhappily confused in our political development by sectional prejudices and by questions peculiar to our federal form of government. In the early years of the twentieth century it is clear that each of the American leading parties has its conservative and its liberal wing; and social reform is unquestionably delayed in the absence of a new alignment that shall bring the two conservative groups into one body and the two radical groups into one party. When this rearrangement occurs, our divisions on state and municipal issues will practically coincide with our divisions upon most national issues, and much of the talk about the evil of party government in these smaller units will disappear. In large measure it seems probable the evil of party government in our municipalities comes merely from the fact that our present traditional and illogical parties do not fit the issues of the city or state.

The countries of continental Europe west of Russia all adopted some measure of popular government during the nineteenth century, and party organizations at once appeared in every case. In none of these large

continental states, however, did the organization go so far or attain so much importance as in England and the United States,—until toward the close of that century. In most such countries party government is still hampered, partly by the surviving monarchic power and partly by a multiplicity of parties,—as in Germany with its twelve or more "parties," some based on religious distinctions, some on local or race issues. A study of such conditions makes it clear that party government, if it is to be effective, presupposes a division into two main parties. "Third Parties" are of use only as a temporary protest or as a step toward a realignment of the old organizations.

Under a system of party government, the balance of power is really held by the intelligent independent voters who are willing to pass from one party to another for good reason. Sometimes this class brings about a change of party; and, more often, fear of losing the vote compels the party managers to modify an otherwise arbitrary policy. Party organization ought to be a means toward good government. Whenever it becomes an end in itself, it becomes an evil. It is proper to observe, too, that the growing movement toward direct legislation promises to reduce greatly the importance of standing party organization.—WILLIS MASON WEST. See REPUBLICAN PARTY; DEMOCRATIC PARTY; PEOPLE'S PARTY; PROGRESSIVE PARTY; SOCIALIST PARTY; PROHIBITION PARTY; LIBERALS; CONSERVATIVES.

Polk, James Knox (1795-1849), the eleventh President of the United States, was born in Mecklenburg County, North Carolina, the son of a Scotch-Irish farmer who also occasionally worked as a surveyor. The future President entered the University of North Carolina in 1815 and was graduated in 1819. In the latter year he began the study of law, and in 1820 he was admitted to the bar in Tennessee, to which state his family had removed. He began practice in Columbia, Tennessee, continuing until his election to the governorship of the state in 1839. His first political position, however, was that of member of the Tennessee house of representatives, 1823-25. In the latter year he was elected to the Federal House, and in 1827 became a member of the Committee on Foreign Affairs. In 1835 he was elected Speaker of the House, holding the position for four years.

During these first years of his political career Polk gained an extremely prominent position in the Democratic party and became known, though erroneously, as an advocate of slavery. After fourteen years in Congress he refused renomination in 1839, to become governor of Tennessee. After serving as the highest officer of the state for one term he twice stood for reelection, but was defeated each time.

PRESIDENCY. The Democratic convention of 1844, after failing to unite on Van Buren, Buchanan or any of the other prominent figures, compromised by nominating Polk. The annexation—or as Polk would have it, the "reannexation"—of Texas and Oregon were the large issues of the campaign. "Fifty-four forty or fight" was the campaign slogan. Polk was elected over Clay, the Whig candidate by a majority of 70 electoral and 40,000 popular votes.

The Mexican War, (see MEXICO, subtitle *History;* TEXAS, subtitle, *History*) was the outstanding feature of Polk's administration; as a result of this war Texas was admitted to the Union, in 1845. The most significant event—after the annexation of Texas—that arose from the war was the attempt to pass the Wilmot Proviso (which see).

A second feature of Polk's regime was the annexation of Oregon without open conflict with Great Britain. In insisting upon the exclusion of slavery from Oregon Territory Polk proved that he was not and had never been a pro-slavery man. Polk insisted on a tariff for revenue, was opposed to large national expenditures for internal improvement, and he was influential in re-establishing the independent treasury system.

At the close of his term President Polk declined to stand for renomination. He retired to his estate near Nashville, where he died in 1849.

Polk, Leonidas (1806-1864), an American soldier and the first Protestant Episcopal Bishop of Louisiana, was born at Raleigh, N. C., and educated at the University of North Carolina and at West

Point. From the latter institution he was graduated in 1827, but he soon resigned from the army to prepare for the ministry. In 1838 Polk was consecrated bishop of Arkansas and Indian Territory with charge of the dioceses of Alabama, Mississippi and Louisiana. In 1841 he resigned all of these save the bishopric of Louisiana, which he held until his death.

During the Civil War he held a major-generalship. At Belmont, Mississippi, in 1861, he was driven from his camp by General Grant, but later compelled Grant to retire. His troops took prominent parts in the battles of Shiloh and Corinth and in 1862 he was promoted lieutenant-general; in this capacity he led the retreat from Kentucky, and after the battle of Chickamaugua he was relieved of his command. Later, however, he was appointed to the department of Alabama, Mississippi and eastern Louisiana, and while reconnoitering on Pine Mountain, June 4, 1864, he was killed by a cannon shot.

Pollard, a tree cut back nearly to the trunk so as to produce a great number of spreading branches. In many parts of Europe, especially France and Holland, pollarding is a common practice.

Pollen. See FERTILIZATION.

Pollok, Robert (1798-1827), the author of *The Course of Time.* His father was a small farmer in the parish of Renfrewshire, Scotland. Young Robert was trained at the University of Glasgow for the ministry of the Presbyterian church. While yet a student he wrote tales of the Covenanters and a poem designed to cover the entire spiritual life and destiny of man. This was his celebrated *Course of Time.* He survived its publication but six months.

Poll Tax. See TAX.

Pollux. See CASTOR AND POLLUX.

Polo, pō′lō, a kind of hockey played on horseback. It appears to have been long a favorite pastime in Persia and Tartary and the frontiers of India, a country where good horses and open plains are common. In 1871 it was brought home to England by cavalrymen returning from the East. In playing, an oblong field, like a football ground, is marked off. A goal is established at each end. A ball three inches in diameter is laid down in the middle of the field. The players, from three to six on a side, are mounted on ponies of regulation size. Each rider is armed with a bat or stick, four feet in length, with a cross piece at the lower end with which to drive the ball. They draw up behind their respective goals. At a given signal they dash for the ball, each player trying to drive it through his opponents' goal. If a player breaks his stick, he is required to ride to the place where a supply is kept. If he drops his stick, he must dismount and pick it up. He is not allowed to strike the ball while out of the saddle. See GAMES.

Polo, Marco (1250-1324), a celebrated Italian traveller. The elder Polo was a wealthy nobleman of Venice. He took Marco with him on a trading expedition to the eastward of the Caspian Sea. The entire region from the Caspian to the Pacific was ruled at this time by the Great Khan. His representatives urged the advisability of an acquaintance with the wealthy regions of China to the eastward, the outcome of the matter being that young Marco traveled eastward and entered finally the service of the khan. In his travels he traversed Central Asia and the desert of Gobi. He had opportunity to see Pekin and other Chinese cities. He was at one time sent back to Europe to request from the pope that one hundred missionaries and men of learning he sent to China to educate the people in the learning of the West. His mission was not successful. When he finally left the service of the khan, he returned homeward by way of India and Abyssinia. He had been absent from Venice for a quarter of a century. He appears to have been fond of telling his experience, but he had no liking for pen and ink. During one of the petty wars for which the city republics of Italy were noted, he was thrown into the prison of Genoa. He improved the interval by dictating his experiences to a French fellow prisoner who wrote them out in detail.

Polo was not only the first European traveler to trace a route across Central Asia, but the first to describe Pekin, the new capital of China. Through Marco Polo the Europeans obtained their first trustworthy knowledge of the Chinese, their dress, customs, and religion, as well as the

first knowledge of Tibet, Burma, Siam, Cochin China, Japan, Java, and Sumatra. His accounts of temples, shaved heads, naked savages, dog sledges, white bears, reindeer sledges, and other countless marvels of Asia were a revelation to Europeans. As this account appeared before the invention of printing it was multiplied in manuscript and passed from hand to hand. The fortunate possessor of a copy was sure of an audience. Some eighty of the manuscripts, differing somewhat in text, are still in existence. His accounts of the enormous wealth of the East, of temples glittering with gold and jewels, stimulated the trade with the East tremendously, and had an important influence eventually on the discovery of the New World. Little is known of Polo's private life. The exact date of his death is uncertain. He was buried in the family sarcophagus in the church of St. Lorenzo, Venice, but in a renovation of the church this appears to have been removed and lost.

Polybius (204-125 B. C.), a celebrated historian. He was born in Arcadia, Greece. He was an officer of the Achaean League but was taken prisoner to Rome about 169 B.C., where he became a friend of the younger Scipio. He was converted to a belief in the destiny of Rome and endeavored to reconcile his countrymen to wear the Roman yoke. As a Greek of influence, a convert to Roman institutions, he had the confidence of Roman statesmen and had access to such historical materials as the wealth and intelligence of Rome could provide. He wrote a history of Rome in forty books, five of which, with fragments of others, are still extant. It was his purpose, as he himself tells us, to set forth for the instruction of future generations, "how and why it was that all the known regions of the civilized world had fallen under the sway of Rome." "Who," he continues, "is so poor spirited or indolent as not to wish to know by what means and thanks to what sort of constitution the Romans subdued the world in something less than fifty-three years." The portions of his work preserved from destruction sketch the early history of Rome and the Punic Wars. Even the fragments are of value to the historian. Polybius relates, for instance, that in northern Italy wheat was worth about six cents per bushel, and that board in an inn cost two-thirds of a cent per day. At the same time wheat was worth about seventy cents in Rome.

Polygamy. See MORMONS; TURKEY.

Polyhymnia, pŏlĭ-him′ni-ä, in Greek mythology, the muse of sacred poetry, and of learning and remembering. Among the Romans she came to be regarded as the patroness of pantomimes. She is represented in art as heavily draped, crowned with flowers, and standing in a meditative attitude with her finger at her lip, or holding a scroll. See MUSES.

Polytechnic Schools. See INDUSTRIAL SCHOOLS.

Pomegranate, pŭm′grăn-ăt, a small, thorny tree, ten to twenty feet in height. It is native to southern Asia and is cultivated in subtropical countries for its glossy green foliage and fruit. A pomegranate looks much like an orange. It is yellow and has a leathery rind full of seeds. Each seed is surrounded by pulp and is wrapped in a skin of its own, each being crowded by its neighbors so closely as to produce a granular interior. Northern Africa and Portugal, Italy, and Spain are celebrated for pomegranates. They are cultivated in the Gulf States, California, and Utah. Pomegranates are a cooling, grateful fruit in hot climates and, when pressed into water and sugar, are a prime substitute for lemons. The pomegranate stands well in literature and history, the "Golden pomegranates of Eden" suggesting rest and comfort.

Pomelo. See GRAPEFRUIT.

Pomona, in Roman mythology, a beautiful wood nymph, who presided over fruit trees. Many a suitor sought her, but she would have none of them. Unlike her companions, who preferred the deep wood, she loved the open near the dwellings of man. The lemon, the lime, the grape, and especially the apple, were her delight. Diana loved to hunt with a javelin in her hand, but Pomona bore a pruning knife with which to trim and graft. This goddess of the orchard led streams by the roots of her favorite trees that they might drink. Her shy, modest ways and her final wooing by Vertumnus form a delightful chapter in the history of myths. Vertumnus was the

god of the seasons. Knowing that Pomona would avoid meeting anyone who came as a suitor, he disguised himself as a reaper; then as a vine-dresser; then as a driver, ox-goad in hand; and again as a fisherman, or a discharged soldier. In this way he saw Pomona frequently and each time wished the more ardently to win her; but his suit advanced not at all, for Pomona did not recognize him as a lover and if she had would have fled his presence. At last Vertumnus disguised himself as an old, gray-haired woman leaning on a staff. The old woman was admitted readily to Pomona's garden, where she kissed the nymph and sat down to rest. She won Pomona's favor by praising her vines and fruit trees.

Pomona, Cal., in Los Angeles County, is a beautiful city situated in the San Gabriel Valley at the base of the Sierra Madre Mountains, 30 miles east of Los Angeles. It is served by the Southern Pacific, Union Pacific, Santa Fe, and Pacific Electric railroads. Pomona is in the center of one of the richest orange growing sections of California, shipping upwards of 5,000 carloads annually. Lemons, nuts, grapes and deciduous fruits are also here prepared for the market. Fruit canning and packing are the principal industries.

One of the finest attractions of the city is Ganesha Park, which commands a good view of the mountains. Pomona College, the city high school and junior college, two junior high schools, kindergartens and the Carnegie library are the chief educational institutions. There is also a Masonic Temple, several small parks and a large modern hospital. The population was 13,505 in 1920.

Pompeii, pŏm-pā′yē, an ancient city of Italy. It was situated on the shore of the Bay of Naples, within a mile of the actual base of Mt. Vesuvius. It was a provincial city of importance and was the home of many wealthy Romans who maintained villas here. They traveled back and forth to Rome by means of galleys, or ships rowed by slaves. In 59 A. D. a riot took place in the amphitheater of Pompeii between the citizens of the place and the visitors. We learn from the historian Tacitus that many were killed and wounded on both sides. As a punishment, the Roman Senate ordered the amphitheater closed for ten years. It was large enough to seat 20,000 people. In 63 a violent earthquake shock ruined many of the public buildings. In 79 A. D. the famous eruption of Mount Vesuvius took place. Herculaneum, a neighboring city, was imbedded in a mass of lava. A mass of material, consisting of small stones and cinders and lighter material resembling ashes, covered Pompeii to a depth of eighteen or twenty feet, simply blotting the city and its inhabitants out of existence. Excavations were undertaken for the sake of finding treasure, but vineyards and mulberry groves soon spread over the face of the country and the very place of the city was forgotten.

In 1748 the city was rediscovered accidentally. Explorations were begun and have continued with increasing efficiency up to recent times. The volcanic material lying over the city has been carted away until many of the streets and blocks have been laid entirely bare and restored as far as possible to their condition previous to the eruption. The ruins of Pompeii are of interest to the historian and antiquarian. During all these centuries the city has lain undisturbed. The buildings, even to the colors on the walls, have remained uninjured, being protected by what may be called a light, fluffy volcanic ash resembling plaster of paris. It is now possible for the student to reconstruct a complete picture of a Roman city as it was at the height of Roman prosperity.

As a rule the streets are straight and are laid out with regularity. Two or three of the main thoroughfares are thirty feet in width. Usually the streets are from twelve to fifteen feet wide, including a footway on either side. They are barely wide enough for the passage of a single vehicle. Photographs of these ancient thoroughfares show that they were paved with slabs of stone, in which the wheels of vehicles have worn two deep ruts. There were stepping stones for pedestrians at the crossings. The houses have an oriental rather than a western appearance. They are built facing inward on an interior court. The outer walls are unbroken, save by a gateway or entrance and small, inconspicuous windows at a considerable height from the ground. Passing

through these gates into the interior courts, however, the visitor finds that no expense was spared in the adornment of the villas of the wealthier citizens. Marble courts, fountains, colonnades of marble pillars, beautiful reception rooms, couches, tables, rich wood, vases, statues, and artistically decorated walls exhibit a high degree of wealth and artistic taste. A favorite decorative color is the so-called Pompeiian red, an effect produced by an oxide of iron paint. The decorators were evidently men of artistic training and no little skill. The mythologies of Greece and Rome were drawn upon for subjects. Flowers, birds, and wild beasts were worked in with skill. Mosaic work in marble veneer of differing colors was a favorite form of interior flooring and of wall decoration.

Domestic utensils, furniture, mechanics' tools, preserved fruits, various sorts of grain, loaves of bread, cake molds, fishing nets, pieces of decorated wall, statues, specimens of mosaic, and the like, have been placed on exhibition in the National Museum of Naples. Many inscriptions have been cared for in this way, but no manuscripts have been discovered. Among other interesting articles is a box of tablets on which are scratched the accounts of a banker. The walls of semi-public places were found to be covered with the scribblings of loungers; some of these are witty, some instructive, others merely coarse and scandalous.

The baths were found to be in so perfect a state of preservation that the details of Roman bathhouses previously conjectured may be understood here at a glance. The appointments for warm and cold baths, attendants, the care of clothing, etc., were found to be complete.

In certain parts of the city the lower part of the house, facing on the street, was planned usually for a shop. The front of the shop was open to the street, but was provided with wooden shutters to be closed at night or in time of disturbance. Fragments of these shutters have been found. Shops of silversmiths, cooks, mixers of hot drinks, bakers, grinders of flour, fullers, dyers, tanners, and painters have been identified. The office of a surgeon was also identified. Many of his instruments were of ingenious construction, but were made of bronze. In a sculptor's studio blocks of marble, half finished statues, and tools with which he worked, also of bronze, were found in a good state of preservation, as though he had left them and fled. Many of the buildings were entirely deserted, showing that the inhabitants had escaped either to the country or by way of the sea. In others, the remains of the entire family, including servants, were found, usually, however, in cellars or subterranean passages, in which they had evidently taken refuge. In all about 300 skeletons were found. For a graphic account of the horrors of the eruption and the blackness which fell upon the city, the reader is referred to Bulwer-Lytton's spirited novel, *The Last Days of Pompeii*. See also HERCULANEUM; PLINY; VESUVIUS.

Pompey, pŏm′pĭ (106-48 B. C.), surnamed the Great, a famous Roman general. He was an ambitious young man of aristocratic birth. Owing to his rapid rise he incurred the jealousy of the senatorial party. He then turned to the common people and bargained with them for the consulate, to which he was elected 70 B. C. In return for their assistance he abolished the aristocratic constitution under Sulla and set up the more plebeian regulations of the Gracchi. He came into power at a time, however, when it mattered little by what constitution the Romans were nominally governed. As a matter of fact, they were subject to the caprice of whoever happened to be in power. Pompey performed several services that gave him a hold on the populace. He crushed the Marian party in Sicily and Africa and reduced the entire peninsula of Spain, then in a state of revolt, to subjection. The Mediterranean Sea was infested by pirates, who made it difficult and hazardous for the Roman merchants to import wheat. The pirates were so numerous and so well organized that they visited various parts of the coast with regularity, collecting tribute or carrying away treasure. They had no less than 1,000 vessels with well appointed dockyards and arsenals. They had, it is said, as many as 400 mountain fastnesses to which they retreated with their booty. They were even bold enough to attack a Roman fleet at the mouth of

the Tiber. Pompey was given command of an army of 100,000 men and a fleet of over 200 ships. He prosecuted a war against the pirates with vigor and soon cleared the entire Mediterranean of these pests.

In the far East, he conducted a successful campaign against Mithridates, a prince who has always been named with respect as an enemy of Rome deserving to rank with Hannibal. Pompey also conquered Syria and Phoenicia and created a new Roman province. In 63 B. C. he captured the city of Jerusalem. This was the first direct contact of the Roman and the Jew. On his return from this circle of conquests he enjoyed the greatest triumph Rome had ever known. Like a Columbus returning from a new world, he was conducted in triumph through the streets. Three hundred and twenty-two princes walked in chains before his chariot; banners were borne aloft proclaiming that he had overcome twenty-one kings, captured 1,000 strongholds, exacted tribute from 900 towns, and made prizes of 800 ships. Twelve million people, it was announced, had been brought under Roman rule, and $25,000,000 placed in the public treasury. The tribute to be exacted from these conquered provinces might be expected to double the revenues of Rome. The shouting populace hailed him as the conqueror of Europe, of Asia, and of Africa.

In the meantime history had been making at Rome. The conspiracy of Catiline had been formed and detected. Cicero had come into prominence and was hailed by the populace as the savior of his country. Pompey now entered into an agreement with Caesar and Crassus, forming the so-called First Triumvirate. The early death of Crassus left Caesar and Pompey to divide the Roman world between them. While Caesar was absent on his famous Gallic campaign Pompey was endeavoring to so fortify himself at Rome as to exclude Caesar from the partnership. He neglected no means of attaching people of importance to him. He pleased the populace with games and amusements on a magnificent scale. He erected an immense theater on the field of Mars, capable of seating 40,000 spectators.

The rest of Pompey's story is soon told. Caesar, who was kept informed by friends of what was going on in the city, marched upon Rome with his army, 49 B. C. Pompey and his influential friends, including the majority of the Senate, did not wait for Caesar's arrival, but fled eastward over the Apennines, following the great military road to Brundisium. Here they crossed the Adriatic into Greece with 25,000 soldiers. The senators held pretended meetings at Thessalonica and proclaimed Rome in a state of rebellion. Early in the following year, having quieted Italy and Sicily, Caesar crossed over to Greece with an army and met Pompey's forces on the plains of Pharsalia in Thessaly. It is needless, perhaps, to add that Caesar was completely successful. Pompey fled from the battlefield with a few attendants and escaped to Egypt. On former occasions Pompey had loaded the reigning Ptolemy with favors, and now hoped for a welcome and protection. When Caesar landed in hot pursuit Pompey's bloody head was presented to him in a basket. The sight of the face of his old friend is said to have been too much for Caesar. He burst into tears. The assassins, who had hoped to gain favor, were ordered to execution. Pompey's remains were buried with honors.

The news of Pompey's death was received with sincere regret at Rome. Caesar deemed it wise to cause or permit the erection of a monument in his honor. For a clearer statement of the respective political views held by Pompey and his great opponent, the student is referred to the article on CAESAR. See also CRASSUS.

Ponce de Leon, pōn'tha da la-ōn' (1460-1521), the discoverer of Florida. He was born in Aragon, Spain, and died in Cuba. As a youth he served in the wars of Granada, by which the Moors were expelled from Spain. He served under Columbus on the occasion of the latter's second visit to the New World. He took an active part in the establishment of colonies in the West Indies and held various prominent positions by appointment of King Ferdinand. He was at one time governor of Porto Rico. With other gallants of the age, he believed in the existence of a fountain of youth, that somewhere a fountain welled from the

earth, the waters of which were capable of conferring perpetual youth on those who drank. Popular belief located this fountain on an island. In 1512 he obtained a patent for this supposed island, and in the next year he set out with three ships in search of it. March 27, 1513, he came in sight of the mainland of the United States and gave it the name of Florida. April 2d he landed a little northward of the present site of St. Augustine. He coasted southward and westward around the peninsula, still supposing it to be an island. In the autumn, he returned to Porto Rico. In 1521 he again visited Florida, with the purpose of colonization. He was poisoned by an Indian's arrow, on which his expedition returned to Cuba, where he died. The Spanish claim to Florida was based on Ponce de Leon's discoveries. See DE SOTO.

Pondicherry, pŏn-dĭ-shĕr′ĭ, the capital of French India. When driven out of India by the British, France retained certain trading stations. Since the treaties of 1814 and 1815 these tracts, including in all an area of about 196 square miles, have been known as French India. They are mere ports, situated on the east coast and the west coast of southern Hindustan. The total population in 1921 was estimated at 170,846. The colony is represented in the French Assembly by one senator and one deputy. Pondicherry, the capital, has a population of about 46,000. A French governor resides here. Pondicherry is well built, and maintains a public school system. There are cotton and jute mills, employing over 6,000 persons. Pondicherry and the other ports send on to France vegetable oils and other minor exports to the value of about $5,000,000 a year.

Pond Lily. See WATER LILY.

Pons Asinorum, pŏnz ăs-ĭ-nō′rŭm, Latin for the Bridge of Asses. In the English grammar school the term is applied to the fifth proposition of the first book of Euclid's *Geometry,* namely: That if a triangle has two equal sides, the angles opposite those sides are also equal. It was considered that dull students would show their inferiority by holding back at this proposition, as asses do when led over a bridge. See EUCLID; GEOMETRY.

Pontchartrain, Lake, a body of salt water, is in southeastern Louisiana, about four and one half miles north of New Orleans. The lake is connected with the Mississippi River by the Inner Harbor Navigation Canal, completed early in 1923. Pontchartrain is 36 miles long and 22 miles wide, and has natural connection with Lake Borgne and Mississippi Sound.

Along the north side of the lake the shore is dry and healthful and is lined with pine woods. The south shore is marshy and on the west are cypress swamps. The completion of the Inner Harbor Canal renders Ponchartrain highly valuable to the industrial life of New Orleans.

Pontiac, pŏn′tĭ-ăk (1720-1769), a chieftain of the Ottawa Indians. By reason of his prowess as a warrior he became leader of the Ottawas, the Ojibways, and the Pottawattomies. During the French and Indian War he supported the cause of the former. He contributed largely to the defeat of General Braddock, and is thought by some to have commanded in person. He bitterly resented the entrance of the British into his country. In 1762 he formed an alliance of Indians throughout the West, known as Pontiac's Conspiracy. It was arranged that each tribe of Indians should attack the British post in its vicinity on or about the same date. Pontiac conducted the attack on Detroit in person. He planned at first to take the fort by strategy. He asked the commandant for a conference, at which he appeared with a large number of his warriors wrapped in blankets. The commander, having been warned of intended treachery, however, had a company of troops with loaded rifles present in the council chamber. When Pontiac demanded the cause of such an unusual guard, the commander raised the blanket of the nearest warrior, revealing a rifle which had been filed off short so as to permit of concealment. Each warrior was armed likewise. His stratagem being thus discovered Pontiac and his allies rose grimly and walked out. The wily chieftain then proceeded to lay siege to the fort. Ships coming with provisions and reinforcements were waylaid. A considerable detachment of troops ventured out on a sally, fell into an ambuscade at Bloody Bridge, and were cut off. An account of the siege forms one

of the most interesting chapters in Parkman's *Conspiracy of Pontiac*. It was prolonged for a considerable length of time before reinforcements arrived and the savages were forced to withdraw. Elsewhere the attacks were more successful. Of twelve posts attacked, eight fell into the hands of the savages. With the exception of Oswego, Niagara, Fort Pitt, and Detroit, the entire region of the Great Lakes and the Mississippi Valley was reoccupied by the Indians. In the following year Colonel Bouquet made a successful expedition against the Indians of Ohio. Pontiac's allies, perceiving the contest to be vain, fell away from him and made peace with the British. Sir William Johnson, of Oswego, New York, persuaded the Indians of New York to make peace. Pontiac, however, haughtily refused to yield. He took refuge in Illinois, where it is said a British trader bribed a Peoria Indian to murder him, the compensation being a barrel of rum. The place of his death was Cahokia, an Indian village on the east bank of the Mississippi, a little below St. Louis. At the time of his death he wore a French uniform presented to him by General Montcalm. He was buried where the city of St. Louis now stands. He was, without doubt, one of the ablest red men in America.

Pontiac, Mich., a manufacturing city and the county seat of Oakland County, is situated on the Clinton River and on the Grand Trunk and the Pontiac, Oxford & Northern railroads, 26 miles northwest of Detroit. It is in a beautiful lake region, and has become a popular summer resort. The city's principal manufactures are automobiles and automobile accessories, foundry products, hardware, gas and gasoline engines, flour, lumber, paints and varnish. It has the State Hospital for the Insane, a ladies' library, a beautiful public high school and a large Federal building. Founded in 1818, the city was named for the Ottawa Indian chief, Pontiac. In 1920 the population was 34,273.

Pontoon. See BRIDGE.

Pool. See BILLIARDS.

Poole, William Frederick (1821-1894), an American librarian. He was born at Salem, Massachusetts, December 24, 1821. He died at Evanston, Illinois, March 1, 1894. He is known chiefly as the author of *Poole's Index to Periodical Literature,* a work which he appears to have begun in 1848, the year before he was graduated at Yale. He was one of the best known librarians in the United States. He began work as an assistant in the Boston Athenaeum in 1851. In 1852 he was made librarian of the Boston Mercantile Library. He held successively the librarianship of the Boston Athenaeum, the Cincinnati Public Library, the Chicago Public Library, and the Newberry Library at Chicago. In 1877 he was made vice-president of the International Conference of Librarians at London, and in 1885 president of the American Library Association. These positions gave him excellent opportunity for his work. His famous *Index* contains not only the titles of the articles that appear in the various periodicals, but a short summary of their contents. A student desiring to write an article on iron, for instance, can obtain from the *Index* a list of all the magazine articles on that subject that have appeared since the beginning of the *Index*. The *Index* was for a time alone in the American field, but of late it has had a worthy rival in Wilson's *Readers' Guide to Periodical Literature,* published at Minneapolis, Minnesota.

Poor Laws, laws governing and regulating relief of the poor. Charity has been recognized as an obligation in all civilized nations, and the last century has marked a steady advancement of definite systematization of the relief that is extended, either by private initiative or through the use of state funds. In England the parishes were ordered to care for their poor as early as 1536. The law of 1601 became famous and is now the basis of all laws governing public poor relief. It emphasized the need of insistence on the "setting to work of able-bodied men" and every inhabitant of each parish was taxed in order that a relief fund might be maintained. The first workhouse was established in Bristol in 1697. In the eighteenth century when the humanitarian movement swept over Europe many of the evils which resulted from indiscriminate giving were corrected. Gilbert's Act of 1782 was directed against this general mismanagement, but it was not until 1834 that a radical reform

was effected. It had been discovered that hundreds of able-bodied men depended on the relief funds and did not hesitate to join the ranks of the paupers. Much of this looseness and dependency grew directly out of the Speenhamland Law of 1795 which set up a standard as a "living wage" and provided for those who failed to receive this amount with funds out of the public treasury. As a result of this, workmen had been content to work for lower wages, and employers profited by this arrangement, frequently discharging them until they were put on the "poor relief" list and then rehiring them at a lower wage. The law of 1834 reformed this by requiring all able-bodied persons receiving aid to live in the work-houses where they would be known as paupers. During the period from 1900 to 1904 the average amount annually expended in England for poor relief was £12,319,108.

The Poor Laws of the United States are based on the English Law of 1601. Almshouses are maintained by towns or counties, and a great number of individual enterprises have undertaken reforms which have later been adopted by public institutions. Laws have been enacted forbidding mendicancy and vagrancy, but there are constant violations of the same. A State Board of Charities has been organized in a great number of the states. In 1870 the Charity Organization Society was established, and in 1874 prominent philanthropists met to organize the National Conference of Charities and Correction which has since met annually. Much has been done, but the number of dependents is not decreasing, but the ideal which governs both public and private charities at present is the same as the idea expressed by Malthus: "It is in the highest degree important to the general happiness of the poor that no man shall look to charity as a fund upon which he may confidently depend."

See PAUPERISM.

Poor Richard's Almanac. See FRANKLIN, BENJAMIN.

Popcorn, a dwarf variety of Indian corn or maize. When ripened popcorn is heated intensely, the small amount of water which it contains is converted into steam which swells the grains of starch and causes the kernel to explode or burst with a sudden popping sound. The original hull or outside of the kernel is then almost concealed by the white interior which swells out to several times its former size. Strangely enough, the best results are obtained when the corn is thoroughly dry. In popping, the corn should be heated quickly without being allowed to char or burn. Popcorn is thoroughly wholesome, and is eaten usually with the addition of a little salt and butter well stirred in. When mixed with molasses it may be formed into popcorn balls, or the "crackerjack" much sold on trains and at refreshment stands. "Popping" is not confined to popcorn. Clover seed pops; indeed this is one of the tests for sound seed. See CORN.

Pope. See PAPACY.

Pope, Alexander (1688-1744), an eminent English poet of the Queen Anne or classical period. His parents were Catholics, his father a linen merchant. He was born at London, and, being deformed, was educated at home. He was a dwarf in size, only four feet high, and so crooked that he was called an interrogation point. Even when grown up he sat in a high chair at table. He had so little warmth in his body that he wore heavy clothing and three pairs of stockings. His temper was tart and crabbed. He began writing creditable verse at the age of twelve. At sixteen he was recognized as the sharpest political writer of the day. His services were considered so valuable to the government that the first opportunity was taken to make him a grant of $35,000. He was able, in 1717, the year of his father's death, to retire with his mother to the suburb of Twickenham, where a beautiful lodge was set in five acres of walks, walls, vines, flowers, and foliage. He worshiped his mother and surrounded her with every comfort, but he was not a pleasant man in society.

On account of his fame he was invited to the homes of the nobility, but, as a matter of fact, he was dreaded by guests and servants. They made him just about as welcome as they would a wasp. He dressed elegantly and was refined in bearing. He was an omnivorous reader and worked like a slave in polishing off his verse, writing

Buddhists	138,031,000
Hindus	210,540,000
Confusianists and Taoists	300,830,000
Shintoists	25,000,000
Animists	158,270,000
Unclassified	15,280,000
Total non-Christian	1,081,981,000
Grand total	1,646,491,000

On the basis of the estimated populations as given above it is to be seen that the average is 1,704,497,000, or about 35 to a square mile of the earth's surface.

Populist Party. See PEOPLE'S PARTY.

Porcelain, pôr'se-lĭn, a sort of pottery. It is the most delicate and expensive ware produced by the potter. When held up toward a window it allows more light to pass through than ordinary chinaware. It is less transparent than glass. The word is borrowed from the Italian name for the polished glassy Venus shell, so-called from its similarity in shape to the back of a little pig. Carried back to its origin, porcelain means little pig and has reference to shape rather than to the kind of ware. So far as known, this kind of ware originated in China. The body is formed of kaolin or fine pottery clay, combined with feldspar, white sand, chalk, ground flint, or some other glassy material. It is, in composition, therefore, somewhat between ordinary chinaware and glass. Articles are formed on the potter's wheel. They are burned at a low temperature to make them hard enough to handle. They are then dipped in a liquid glaze and are subjected to prolonged and hard firing. During this process they are inclosed in earthenware crucibles and protected carefully from smoke. When fired sufficiently they are allowed to cool very gradually. The porcelains of China and Japan are celebrated. The most noted European porcelains are those of Sevres, France, and of Meissen or Dresden, Saxony. The latter ware, or something very similar to it, is produced also at Berlin and in Grandenburg, whither the secret was carried by workers from Meissen. Factories of less note are found in England, the Netherlands, Italy, etc. A cheap porcelain is made near Brooklyn, Long Island. See POTTERY; SEVRES.

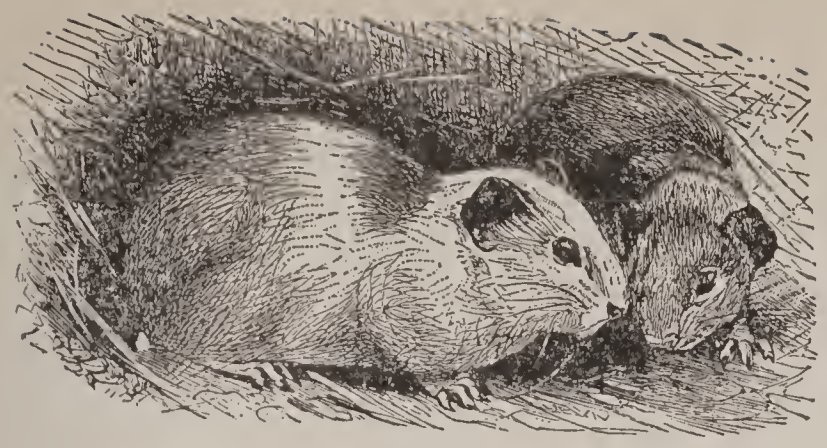
Porcelain Tower. See NANKIN.

Porcupine, a family of ungainly, clumsy tree-climbing animals distinguished by the development of bristles into hollow barbed quills like the lower part or shaft of a feather. The term porcupine signifies swine thorn. There are about fifty species in the family. They are in no way related to the hedgehog. The common Canadian porcupine is found from eastern Canada to Mexico, chiefly in exergreen regions. It is a dark brown, low set, heavy, sluggish animal covered with spines tipped with yellowish white. The porcupine is about forty inches in length including the tail, and weighs from fifteen to forty pounds. Its claws are well adapted for climbing trees. It feeds chiefly at night on the bark and twigs of the birch, poplar, hemlock, and maple. It has chisel-shaped teeth, like those of a mouse or beaver.

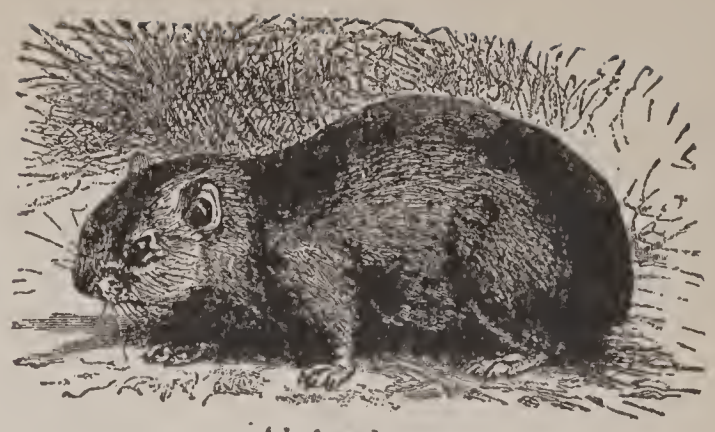
Its back and heavy tail are thickly covered with spines from four to six inches long which are the animal's chief defense. They have points like a cambric needle and are barbed like a fish hook. If molested and a tree be near, the porcupine tries to scramble up out of reach, but otherwise makes little attempt to escape. It lays its tail along the ground until an enemy comes within reach, when it strikes with a heavy slap. The quills are exceedingly sharp and are easily detached from the skin. A dog's face filled with quills from the slap of a porcupine's tail is a pitiful sight. Animals frequently die from the effects of the quills, which, by means of their barbs, are worked deeper and deeper into the fiesh by its own muscular action.

Hunters, campers, and lumbermen in wild regions find porcupines exceedingly troublesome. They come around camp at nightfall and, while inoffensive, they cut harnesses, gnaw boots and ax-handles, cut into casks, and commit other annoying depredations for the sake of salt, of which they are very fond.

The porcupine's quill is, of course, a very large hollow hair. It is the nearest approach to a feather worn by any animal other than a bird. The quills are very readily detached from the skin when the barb has become fixed. One can scarcely touch a porcupine without the painful experience of drawing away quills in his fingers. The points are so fine that they



Cavy.



Alpine hare.

Capybara.

European porcupine.

PORCUPINE AND OTHER RODENTS.

are scarcely visible, and one does not realize how near the hand is to them until they have pierced the skin. The popular notion, however, that the porcupine can throw his quills is entirely erroneous. The quills of a North African species are about a foot in length and make very handsome penholders. The North American squaws dye the quills of the Canadian porcupine blue, yellow, and red, and use them for purposes of ornamentation. The edge of a piece of buskskin is slit, for instance, into fine thongs a few inches in length. A quill is threaded on each thong with a knot at the outer end to prevent it from slipping off, thus making an ornamental fringe for moccasins and other garments that gives a pleasing rattle when the wearer walks. Frequently the quills are split into splints, and are woven into various ornamental parti-colored patterns. Longfellow says of Hiawatha that he

> Stained them red and blue and yellow,
> With the juice of roots and berries;
> Into his canoe he wrought them,
> Round its waist a shining girdle,
> Round its bows a gleaming necklace.

But the poet makes two mistakes in natural history when he says:

> From a hollow tree the Hedgehog
> With his sleepy eyes looked at him,
> Shot his shining quills, like arrows.

In Minnesota and some other states, a law exists against killing the porcupine. This is because it is the only wild animal that can be easily killed without the use of firearms, and hence it is protected to furnish food, in time of necessity, to those lost in the woods, or in danger of starvation.

Pork, the flesh of swine when used as food. It is an important article of diet, especially on account of the ease with which it may be preserved by salting or smoking. On account of its heat-giving properties it is prized in cold weather but is not considered a suitable food for frequent use in summer time. Pork-packing is an important industry in the United States. The 1920 exports of pork and lard weighed 1,457,410,349 pounds and were valued at $356,371,979. There is a popular prejudice against pork, due in part, probably, to the fact that the religious beliefs of both Jews and Mohammedans lead them to avoid it, but so far scientific food experiments show no particular difference in the composition of lean pork, beef, and mutton so that no person in health need fear good pork which has been well cooked.

Porphyry, any compound rock which has a single mineral as a basis in which other minerals are imbedded. The basic mineral may be one of a number of rocks, —feldspar, jade, and pearlstone are some of them. The imbedded minerals are usually quartz, or another kind of feldspar. Porphyry is often used instead of marble in decoration. It is very hard, being superior to marble in this respect, and often of a red or green color.

Porpoise, pôr′pŭs, a well known animal of the coasts and harbors. It has the appearance of a clumsy fish, but in reality it is a relative of the whale, manatee, and other cetaceans. Most of all, it resembles the dolphin, but it is smaller; it has a blunt nose, and a heavier build. The name is French, signifying pork-fish. The German name is sea-swine. Although the porpoise is a degenerate land animal, the skin is smooth and destitute of hair. The eye is small and shaped like that of a pig. All members of the family require to breathe at intervals, which they do by means of a single nostril situated in the top of the head. The operation is called blowing. The breathing of the whole family, and especially that of the grampus, a twenty foot porpoise of the North Atlantic, is so noticeable that seafaring people nickname a fleshy, short-winded person a grampus. To puff and blow like a porpoise is also a common colloquial expression. Porpoises go in schools like fish. Sometimes they swim in single file, at a distance suggesting a sea serpent. They gambol goodnaturedly about in the harbors to the great satisfaction of onlookers. Like the seal, the porpoise pursues fish. Vast numbers of herring and mackerel are devoured by schools of porpoises. The skin of the porpoise is an inch thick. It is sheared down to form leather. It makes the best leather shoestring known. The flesh is dark and strong. It was once an article of diet in England, and also in Europe,—but its use as an article of food is said to be confined now to the Eskimos. See DOLPHIN.

Port, harbor or haven for ships, whether natural or artificial. In the language of the sea, the term port is also applied to (a) an opening in the side of a ship, especially an embrasure in the side of a ship of war, through which guns may be pointed; (b) the larboard or left side of a ship, when one is looking forward, the right side being called starboard.

When used in the sense of a harbor, a port may be a bay, cove, inlet, or recess of the sea, or of a lake, or the mouth of a river, where vessels can be protected from storms. But the term port is usually applied to a place where there is a constant resort of vessels for the purpose of loading and unloading; and in law it is defined as a place where persons and merchandise are allowed to pass into and out of the realm and at which customs officers are stationed for the purpose of appraising imported goods. In this sense, a port may exist on an inland frontier, where the foreign communication is by land. For this purpose ports are established by the sovereign power; that is, by the king or state. Thus Blackstone says: "The king has the prerogative of appointing ports and havens, or such places only for persons and merchandise to pass into and out of the realm as he in his wisdom sees proper."

The idea of a port is essentially that of a gate, from the Latin "porta." A subject or private citizen cannot establish a port without charter from the state; and this is seldom given in modern times to any but a public body. In the United States and England, ports are public institutions, established and administered by government authority. Ports are always established in public waters, usually a bay of the sea or at or near the mouth of a river; or, as in certain cases, in the Great Lakes of North America, ports may be established in artificial harbors, formed by building breakwaters, docks, piers, etc. In many cases there is a dual jurisdiction over ports and harbors; thus, harbor tolls may be collected from vessels by a municipality and customs tolls and duties by the national government.

When a port is established, either by public authorities or by a private citizen or corporation acting under charter from the state, it must be maintained in good order, kept free from all obstructions to navigation, and in times of peace, be open to all vessels, regardless of their nationality. The state has the right to enforce port regulations for the preservation of the public peace, health, and safety.

Kinds of Ports. A port of entry is a port where a custom-house is maintained for the entry of goods into a country, or any point designated by a government for the unloading of foreign goods or merchandise, and their release into domestic trade. Ports of entry were formerly located only on a frontier, and chiefly in seaports; but with the development of the system of shipping dutiable goods in bond, any city may be designated as a port of entry, even though it be located inland or at a considerable distance from the frontier. There must, however, be facilities for the examination of goods, the collection of tariff duties, and the warehousing of goods held in bond.

A free port is one where importations are not subject to any tariff or customs duty on landing. Hence the term has been sometimes used of the like privilege enjoyed by a particular class of merchants, or in respect to particular classes of goods. The term "free port" is specifically applied to ports such as the Hanse towns of Germany, namely, Lubeck, Hamburg, and Bremen (until 1888), or to part of a harbor, such as the island made for the purpose on the Elbe when those cities surrendered their privileges as free ports, where goods are allowed to be landed free of all duty, on condition that they be not carried thence into the country without payment of duty; the object being to facilitate traffic by reshipment to other countries.

A port of call is one at which vessels are in the habit of touching, during a voyage, for repairs, stores, coal, etc., or for further sailing orders. Port charges, in commerce, are the charges to which a ship or its cargo is liable in a harbor, as wharfage, lighterage, towage, etc. A close port is one which is located up a river, in distinction from one that is situated on the seacoast.

The principal seaports of the world include those of New York, London, Liver-

pool, Antwerp, Hamburg, Hong Kong, Buenos Aires, Gibraltar, Marseilles, Rotterdam, Montevideo, Shanghai, Yokohama, Kobe, Singapore and Rio de Janeiro. New Orleans is the second port in the United States.

Portage, in the history of American exploration, a break in a chain of water communication, a pathway over which goods and canoes must be carried, as from the headwaters of one river to another, from one lake to another, or around rapids. Canada, the Northwest Territory, and the divide which separates the Great Lakes from the Mississippi Valley abound in portages, with which the employes of the Hudson Bay Company, the French voyageurs, trappers, Jesuit missionaries, explorers, and Indian guides were familiar. The portages were the most tiresome parts of the long canoe journeys. On reaching a portage everyone went ashore, the canoes were emptied, the contents were made up into bundles and carried on the backs of boatmen from one water to another, sometimes a few rods, often many miles. A small birch bark canoe was turned upside down and carried by one man on his head. Larger boats required more carriers.

On the trips toward Montreal and the other fur centers portaging was comparatively light. Guns, paddles, boats, and bales of fur were the principal articles to be carried, but on the outward journey there were heavy bales of merchandise and flour. Sometimes the toilsome labor of crossing a portage occupied several days. A student will have no difficulty in locating approximately, at least, the portages between the Penobscot and Alleguash; the Connecticut and St. Francis; the Hudson and Lake George; the Mohawk and the Oswego; the Wabash and the Maumee; the Illinois and Lake Michigan; the Wisconsin and the Fox; the St. Croix and the Bois Brules; Pigeon River and the head waters of Rainy Lake; the Ottawa and Georgian Bay, etc.

Portage la Prairie, Manitoba, a railroad center 56 miles west of Winnipeg. Various industries maintain a population of about 6,766. Lake Winnipeg, 15 miles distant, with its noted good fishing, makes the town a popular summer resort.

Port Arthur, Ontario, an important commercial and industrial city, is on Thunder Bay on Lake Superior, 2,000 miles from the Atlantic and 1,900 miles from the Pacific, 423 miles east of Winnipeg and 872 miles northwest of Toronto. The city is served by the Canadian National, Canadian Pacific and other railroads; vessels of 2,500 tons navigate to the sea, and the city will soon be the chief port of western Canada, for improvements are under way that will permit the passage in and out of vessels of 10,000 tons.

The principal item of Port Arthur's extensive commerce is grain; there are elevators owned by the Dominion government, the Canadian National railroads, and by private companies, having with Fort William (which see) a total storage capacity of 65,000,000 bushels. Here is located one of the largest ship building plants in the Dominion; the Canadian National Railroad's coal and ore docks; and manufactories of pulp and paper, lumber, tents and awnings, biscuits, aerated water, bricks and other articles.

Port Arthur's educational institutions include public graded schools, collegiate institute and libraries. The Whalen office building is the city's most imposing structure. The Prince Arthur Hotel, owned and operated by the Canadian National Railway, is one of the finest hotels in Canada. The city's utilities are all municipally owned; the streets are paved and well lighted; and there are several attractive parks. Almost all of the hotels, hospitals, theaters, schools and churches are handsome buildings. The collegiate institute building is one of the finest in the province. The population of Port Arthur was, in 1921, 14,886.

Port Arthur, a seaport at the southern extremity of Manchuria. The port is guarded by fortified heights that command the entrance from the Yellow Sea to the Gulf of Pe-chi-li. Outside ships, bound for Tien-tsin, the port of Peking, must pass under the guns of Port Arthur. The Japanese captured Port Arthur from the Chinese during the War of 1894. The Russians prevailed on their allies, German and French, to force Japan to return the port

to China. Four years later Russia leased Port Arthur from the Chinese. The Russians proceeded to improve the fort and strengthen its fortifications. During the war with Russia, the Japanese blockaded the fort and proceeded to reduce the fortifications. The siege is one of the most memorable in history. It began in May, 1904. The fort surrendered in January, 1905. A fleet blockaded the fort and a force of 60,000 Japanese invaded the fortifications by land. The Russians surrendered 50 forts, 48,000 men, including 8 generals, 4 battleships, 2 cruisers, 14 torpedo boats, and 546 large guns. The total Russian loss included 50,000 lives and $300,000,000 worth of property. The Japanese loss of life was as great. The siege cost the Japanese about $25,000,000. The town and port were little injured. Port Arthur remains in possession of the Japanese. See MANCHURIA; RUSSO-JAPANESE WAR.

Port-Au-Prince, the capital and chief port of the Republic of Haiti, is on the western coast of the island opposite the island of Gonaives. The town is built on low marshland at the foot of the hills that overlook the bay; it was well planned and the streets are wide and straight, but the buildings are poor, wooden structures in various stages of collapse.

Port-Au-Prince was founded by the French in 1749, and in 1751 and again in 1770 it was almost destroyed by earthquakes, and has on several occasions suffered heavily from fires. After the French withdrew from Haiti, decline was rapid.

The town has a wooden palace, a cathedral, a mint, a college, a lyceum and several public schools. At the last census the population was 120,000.

Port Colborne, Ontario, a port of entry on the north shore of Lake Erie at the mouth of the Welland Canal, is 24 miles west of Buffalo, N. Y., and 20 miles southwest of Niagara Falls. From the Falls the city receives hydro-electric power, which is used in the manufacture of cork, cement, flour and grist, nickel, iron and finished lumber. The harbor is 22 feet deep and has good docks, and the city has a large export trade. The largest flour mill in Canada is located here. Next in industrial importance are a nickel refinery, an iron foundry and a smelter. Railroad transportation is provided by the Canadian Northern and Grand Trunk lines.

Port Colborne has paved and lighted streets, a library and good public schools. Near the city are several popular summer resorts. In 1921 the population was 3,415.

Portcullis. See CASTLE.

Port Elizabeth, the second city of Cape of Good Hope Province, South Africa, is situated on Algoa Bay, 435 miles east of Cape Town. The city is built on the slopes and crest of a barren hill overlooking the bay, and is quite unattractive, though well built. It is in a commercial sense that Port Elizabeth is important. It is the nearest port to Kimberly, with which it has rail connection, and is the supply station for many other important inland settlements.

The harbor is open, but the roadstead is good, permitting vessels of 21-foot draft to enter and load and unload at the numerous jetties. Among the interesting buildings are the Feather Market, where ostrich feathers are sold, the public library, court house, post office, town hall, public schools and a college. The city has a large botanical garden. In 1921 the white inhabitants of Port Elizabeth numbered 25,940.

Port Hope, Ontario, a port of entry and the county town of Durham County, is on the north shore of Lake Ontario, 163 miles east of Toronto. Lake and river steamers call at Port Hope and it is on the Canadian Northern, the Grand Trunk and the Canadian Pacific railroads. The industrial interests of the city are varied, and the factories produce babbit metal, wooden and steel mats, drugs, bricks, enamel ware, iron sewer pipe, plumbers' supplies, lacquer and varnish, flour, lumber, oil burning appliances, baskets, felt shoes and other commodities.

The educational institutions of Port Hope include primary schools, a central school, Trinity College School for Boys and a fine library. There are two large parks, handsome hotels and numerous churches in the city, which is popular as a summer resort. Population in 1921, 4,456.

Port Huron, Mich., a port of entry and the county seat of St. Clair County, is situated on Black River at the head of the St. Clair River, on Lake Huron at its southern most point, and on several railroads. A mile-long railroad tunnel under the St. Clair River connects Port Huron with Sarnia, Canada. The climate, mineral springs and scenery combine to make the city a popular summer resort. Its principal manufactures are: threshing machines, brass goods, paper, knit goods, milling machinery, gasoline engines, overalls and boats. The Grand Trunk car and locomotive shops are located here. The Women's Benefit Association of the Ladies of the Maccabees of the World, the largest organization of its kind in the world, is located here. It has a United States customs house, fine schools, a Carnegie library, a Chamber of Commerce and several parks. The beaches of Port Huron and the St. Clair River are lined for miles with beautiful cottages which are thronged in the summer with visitors. The blue color of the water of the St. Clair River is said to be rivaled only by the Mediterranean Sea. More tonnage passes up and down this river by Port Huron, than enters New York Harbor. The population was 25,944 in 1920.

Porter, David (1780-1843), an American naval commander. He was a native of Boston. When eighteen years of age he entered the United States navy as a midshipman. During the war with Tripoli he was captured with the United States frigate Philadelphia, and was held a prisoner until the declaration of peace. During the war of 1812 he held command of various ships —chief of all the Essex. He was one of the most daring captains in the service. He cruised in the Atlantic and Pacific oceans and captured many British merchantmen, inflicting no little damage on English commerce. Among other prizes were twelve British whale ships, carrying in all one hundred seven guns. The Essex carried at her masthead the popular motto: "Free trade and sailor's rights." In 1814 the Essex was caught in the harbor of Valparaiso by two British men-of-war. After a spirited combat of two hours Porter surrendered. The inhabitants of the city, it is claimed, climbed the surrounding heights and viewed the sight with lively interest. Whenever an American shot told they cheered. When the American flag went down they wept. Captain Porter wrote to the secretary of the navy, "We have been unfortunate, but not disgraced."

In 1823 he was dispatched with a squadron to clear the West Indies of pirates. He did his work well, but one of his officers on a tour of investigation having been thrown into prison in a town of Porto Rico, Porter required the Spanish authorities to liberate him with an apology. Porter was tried at home by court-martial on the charge of having exceeded his authority, an apology being deemed a matter of diplomacy rather than of naval warfare. He was suspended from command for six months. In 1826 he resigned from the American navy and went to Mexico to help that republic in the struggle for independence from Spain. He closed his public service as resident minister of the United States in Turkey. He died at Constantinople. He was a man of intrepid character, without dispute one of the foremost American seamen.

See FARRAGUT.

Porter, David Dixon (1813-1891), an American naval commander. He was born in Chester, Pennsylvania. He was the son of David Porter of the preceding sketch, and was with his father on most of his voyages. In 1826 he accompanied him to Mexico and enlisted as a midshipman in the navy of that country. During the war for Mexican independence he was captured by the Spaniards and held prisoner for a time at Havana. On his release he entered the American navy and later took part in the war against Mexico. During the long interval of peace which now ensued he held various commercial commands, including California mail steamers. At the outbreak of the Civil War his services were called for. He coöperated with Farragut in the capture of the forts below New Orleans, with Sherman in the taking of Arkansas Post, and with Grant in the reduction of Vicksburg. He was with Banks in the Red River expedition. In 1865 he captured

Fort Fisher, the last of the important set fortresses left to the Confederates. He was made rear admiral in 1863, vice admiral in 1866, and admiral in 1870. After the war he was made superintendent of the United States Naval Academy. Admiral Porter was not only a naval commander worthy of his father's reputation, but a writer of no little merit. He wrote a *Life of David Porter, Incidents and Anecdotes of the Civil War, A History of the Navy in the War of the Rebellion,* and other works of note.

Porter, Gene Stratton (1868-), an American author and ornithologist whose stories of the wild people of field and wood have delighted and instructed a very large circle of readers. She was born in Wabash County, Ind., and was educated privately. In 1886, she was married to Charles Darwin Porter. Mrs. Porter was editor of the camera department of *Recreation* for two years and was for two years on the natural history staff of *Outing.* Subsequently, Mrs. Porter was specialist in natural history photography on the *Photographic Times Annual Almanac.* Her books of birds are illustrated with photographs taken by herself. Important in the list of her publications are *The Song of the Cardinal, What I Have Done With Birds, Music of the Wild, Freckles, At the Foot of the Rainbow, Morning Face, Homing With the Birds, Her Father's Daughter, A Daughter of the Land* and *Fire Bird.*

Porter, Jane (1776-1850), an English novelist. She was ä native of Durham, a sister of Robert Ker Porter, a painter of historical scenes. Miss Porter is known chiefly as the author of the two tales, *Thaddeus of Warsaw* and *Scottish Chiefs.* Both are favorites with young readers. The former deals with the history of unfortunate Poland; the latter is devoted to thrilling incidents in the lives of Wallace and Bruce.

Porter, Noah (1811-1892), an American college president. He was born at Farmington, Connecticut, December 14, 1811, and died at New Haven, March 4, 1892. He was graduated at Yale in 1831, but remained to tutor and to study theology. He was pastor of the Congregational Church at New Milford, Connecticut, and later at Springfield, Massachusetts. In 1846 he was appointed Yale professor of moral philosophy and metaphysics. In 1871 he was chosen president of Yale, a position he held for fifteen years. As compared with that of Harvard during the same period, his administration was conservative. He stood closely by the classics. The endowment of Yale was increased, however, and new buildings were erected. A list of his more prominent writings includes a dozen titles. The best known are *Books and Reading,* a guide to the use or purchase of a library; and *The Human Intellect.* The latter has had a wide use as a college text. His name appeared also as the editor-in-chief of various editions of *Webster's Unabridged.*

Portia, in Shakespeare's *Merchant of Venice,* an heiress in love with Bassanio. In that part of the plot which presents the old story of the three caskets, Portia's hand in marriage is to be the reward of him who chooses the right casket. Bassanio makes the right choice. Portia is especially celebrated for her defense of Antonio, the friend of Bassanio. Shylock demands the "pound of flesh" promised by Antonio in case he fails to pay the money he has borrowed. Portia, disguised as "a learned doctor of the law," so judges the case that Antonio is freed. See MERCHANT OF VENICE.

Portland, the chief city of Maine, is situated on a peninsula of Casco Bay. The city commands a beautiful view of water and land and the harbor is studded with many islets which form popular places of summer residence. Many wealthy people of Boston and New York have summer homes here. Portland is a strongly fortified naval station. The first permanent settlement on this part of the coast was made in 1633. The town was destroyed by the Indians in 1676, and again in 1690. In 1716 there were but fifteen male inhabitants. The first town meeting was held in 1719.

Portland derives its importance chiefly from commerce and manufactures. During the winter season, when the St. Lawrence River is closed to navigation, it is the seaport of Canada. Several lines of railroads

center here and extensive docks, elevators and warehouses afford facilities for loading and unloading. Several lines of steamers ply to European ports and it has also a heavy coast trade with the various cities of the Atlantic. Counting large and small, there are said to be over seven hundred manufacturing establishments, with an annual output of goods valued at from $10,000,000 to $15,000,000 a year. Building iron, foundry work, engines and boilers form an important line of manufacture. There are also boot and shoe factories, a match factory, petroleum refineries, chemical works, carriage and sleigh shops, and extensive meat-packing establishments. The city is the center of a large lumber trade and of lumber products such as sash and doors. Fishing is a leading industry.

The city maintains an efficient system of schools and other departments of public service and there is a public library of about 60,000 volumes. The Maine Historical Library of 40,000 volumes is cared for at Portland. An extensive system of parks adds to the natural beauty of the city. The ocean drives are considered among the finest in the world.

Portland takes no little pride in its roll of noted men: Longfellow and N. P. Willis, the poets; Neal Dow, the temperance orator; Senator William Pitt Fessenden, and Thomas B. Reed, a speaker of the House, were born at Portland. The house in which Longfellow was born still stands near the seashore. The house where he was brought up is now owned and occupied by the Maine Historical Society. In 1920 the population was returned at 69,272.

Portland, the metropolis of Oregon and the county seat of Multnomah County, is situated at the confluence of the Willamette and Columbia rivers, about 112 miles from the Pacific Ocean. The largest ocean going ships call at Portland, connecting it with all important Pacific Coast ports and with the Orient. Rail transportation is afforded by the Great Northern, Northern Pacific, Canadian Pacific, Southern Pacific, Union Pacific, Chicago, Milwaukee & St. Paul and Chicago, Burlington & Quincy railroads.

DESCRIPTION. Portland is built on both sides of the Willamette River, which is spanned by several handsome bridges. The city rises gradually from each bank of the river; nearest the water are the factories and warehouses; the business districts are next and on the highest ground, backed by beautiful woodland, are the residential sections. In the western part of Portland is a hill, Council Crest, from which an excellent view of the forests, mountains and the valleys of the Willamette and Columbia are to be had. The scenic beauty of the surrounding country—dense forests, Mounts Rainier and Hood, broad, swift rivers and numerous waterfalls—attract many people to the city each year.

The park system comprises about 700 acres; Washington Park, Mount Tabor Park, Macleay Park and Peninsula Park, the latter containing the first sunken gardens in the United States, are highly attractive. The city has a zoological garden, and in the parks and at other points stone or bronze statues have been placed.

All of the municipal and county buildings are attractive, as are the Federal building, custom house, Industrial Exposition building, Chamber of Commerce building, Union Station and numerous modern office buildings.

Educational and other institutions of importance are Columbia University, Hill Military Academy, public library, the medical college of the state university, College of Dentistry and Pharmacy, commercial schools and private schools, Good Samaritan Hospital and St. Vincent's Hospital.

INDUSTRY AND COMMERCE. Portland is the natural commercial outlet for a great sweep of fertile agricultural land and for another section in which the lumber industry flourishes. Grain, flour, lumber, canned salmon and dressed meats are the most important items of trade. Manufacturing is well established; the chief products of the city's factories are structural iron, harness and other leather goods, clothing, paint, furniture, soap, boats and ships, foundry and machine shop products, sash and doors, stoves, flour and woolen goods. There is a dry dock in which the largest ships can be accommodated.

HISTORY. Portland was founded in 1845

by two New Englanders, Lovejoy and Pettygrove, and was named for Portland, Maine. In 1851 it was chartered as a city, and after 1870 its growth was very rapid. In the latter year the inhabitants numbered 8,293, while in 1920 they numbered 258,288. In 1905 the Lewis and Clark Exposition was held here, and in 1913 the commission form of government was adopted.

Porto Rico, an island of the West Indies, has been a colonial possession of the United States since the conclusion of the Spanish-American War, 1898. It is the fourth largest of the Greater Antilles group, its area being 3,453 square miles. This area includes that of two small islands —Culebra and Viequez—which form a part of the territory. Porto Rico is bounded on the north by the Atlantic Ocean and on the south by the Caribbean Sea. To the west, 45 miles distant, is Santo Domingo, while St. Thomas is 40 miles distant to the east. Porto Rico is 95 miles long and 35 miles wide, having a coast line of approximately 345 miles.

THE PEOPLE. By the fourteenth census of the United States the population of the island was 1,299,809; of the total inhabitants 948,709 were white, 49,246 were pure blooded Negroes, 301,816 were mulattoes, and the remainder were almost all Chinese. The density was 378 people to a square mile. The capital and chief seaport, San Juan, is also the metropolis, with 70,707 inhabitants in 1920. Ponce, the second city, had 41,561 inhabitants in 1920, while Mayaguez had 19,069. Some of the whites are of Spanish descent, but Americans predominate.

SURFACE AND DRAINAGE. Across the island from east to west extends a mountain range that has a height of from 1,500 to 3,750 feet. This range is in part covered with forests, but where clearings have been made it has been found that the soil is fertile to the summit. North and south from the range the land flattens out into rich pasture and agricultural land that is crisscrossed by many large and small streams. On the Caribbean side of the island it is often, because of droughts, necessary to irrigate. Some of the streams descend so swiftly from the mountains that they are good power sources. The largest of the rivers flowing into the Caribbean are the Ducy, Bucana, Jacaguas, Coamo, Lapa and Guayanes. The largest rivers in the island are those of the north side, including the Loiza, Bayamon, Toa, Cibuca, Manati, Grande de Arecibo and Guajataca. The Blanco is the largest river in the western end of the island. The only lakes of note are Lake Guanica, in the southwest, and Lake San Jose, in the northeast.

CLIMATE. Though the heat of the low sections of the island is intense during the hottest months, the nights are usually cool, and in the hill and mountain country a comfortable temperature is the rule. Even in the coldest months and in the mountains a temperature below 50°F is unusual. Tropical rain- and wind-storms visit the island in July, August and September, sometimes doing considerable damage. The rainfall is heaviest in the north; snow never falls in the island; and frost and hail are rare.

MINERALS. Though mining as an industry cannot be said to exist in the island—with the one exception of salt mining—deposits of gold, silver, iron, copper, tin, mercury, platinum, bismuth and nickel are found. Brick clay, phosphate, slagstone and marble are also found.

AGRICULTURE is the leading industry, the mainstay of the island. Coffee and tobacco are the leading crops, followed by sugar cane, sweet potatoes, corn and cotton. The cultivation of fruits and nuts engages a large part of the population, and these articles are important in the island's commerce. The leading fruits are pineapples, bananas, oranges and grapefruit, while plantains and other tropical fruits are grown for home consumption. Cocoanuts in valuable quantities. In the foothills and on the lowland plains cattle, swine and goats are raised.

MANUFACTURE. In 1920 Porto Rico had about 625 industrial establishments, engaged chiefly in making sugar and molasses, canning fruit, making cigars, cigarettes and other tobacco products, cleaning and polishing coffee, making fertilizer, and in the manufacture of straw goods, boots, shoes and hats.

TRANSPORTATION. There are 339 miles of railroads, 1,100 miles of highways, and other railroads and highways are in prospect. In 1920-21 1,986 American ships called at Porto Rican ports.

EDUCATION. Since 1899, when the educational system of the colony was reorganized and greatly improved, elementary education has been free and compulsory. At the last census there were 1,911 public school buildings. Night schools and kindergartens are maintained, there are numerous private schools, and at Rio Piedras is the University of Porto Rico, a coeducational institution of higher learning. The people are, however, 55.0 per cent illiterate.

GOVERNMENT. The governor, attorney-general and commissioner of education are appointed by the President of the United States subject to approval by the Senate, while the heads of the departments of finance, interior, agriculture, labor and health are appointed by the governor of the colony subject to approval by the Porto Rican senate.

From 1900 to 1909 the colony was administered under the Foraker Act, after 1909 until 1917 under the Olmsted Act, and since 1917 under the Jones Act. The latter effected radical changes in the government and extended to all who desired it full citizenship under the United States Constitution.

HISTORY. Porto Rico was discovered in 1493 by Columbus. In 1509 Ponce de Leon was appointed governor. The early Spanish settlers were nearly exterminated by the Indians, but they finally reduced the natives not only to subjection, but to slavery. Negro slaves were introduced at an early date to work the rice, sugar and tobacco plantations. The Spanish settlements suffered from attacks by Sir Francis Drake in 1595, and were for a long time subject to harassing demands by the buccaneers and pirates for which the West Indies were noted. Porto Rico took no part in the uprisings of the South American republics in the early part of the nineteenth century, but remained loyal to Spain. Slaves were freed in 1873, the slave holders being compensated by the government. On July 25, 1898, the island was occupied by American forces, and at the close of the Spanish-American War it was ceded to the United States.

One of the most serious problems in the colony is that of health and sanitation. A commission sent to Porto Rico by the Rockefeller Foundation in 1920 reported that 90.0 per cent of the people were hookworm sufferers. Malaria and tuberculosis are also grave menaces. Advance in the matter of general health has not kept pace with economic and intellectual progress, but there were indications in 1923 that vigorous effort would be made to drive disease from the island.

STATISTICS. Following are the latest reliable statistics available:

Area, square miles	3,606
Population (1920)	1,299,809
White	948,709
Black	49,246
Mulatto	301,816
Chief Cities:	
San Juan	70,707
Ponce	41,561
Mayaguez	19,069
Members of state senate	19
Members of house of representatives	35
Salary of governor	$10,000
Representatives in Congress	1
Assessed valuation of property	$264,514,176
Bonded indebtedness	$11,946,000
Farm area, acres	2,022,404
Improved land, acres	1,303,547
Tobacco, pounds	19,362,826
Cotton, bales, (500 lbs.)	460
Sugar cane, short tons	489,818
Sugar, tons	490,000
Sweet potatoes, bushels	1,188,018
Coffee, pounds	53,209,362
Corn, bushels	666,196
Beans, bushels	272,324
Cocoanuts, value	$1,001,460
Domestic Animals:	
Horses	46,922
Mules	6,667
Milch cows	96 592
Other cattle	167,118
Goats	32,971
Swine	98,760
Manufacturing establishments	619
Capital invested	$84,161,310
Raw Material used	$59.827,274
Output of manufactures	$85,506,834
Tobacco products, value	$ 8,135,000
Imports	$68,354,363
Exports	$78,741,406
Miles of railway	339

Port Said. See SUEZ CANAL.

Portsmouth, N. H., one of the county seats of Rockingham County, and the only seaport in the state, is situated on the Piscataqua River, about three miles from the Atlantic, and on the Boston & Maine Railroad, 57 miles north of Boston. The harbor is large and deep, and is dotted with islands. On one of these islands is the United States navy yard, in which were built such famous American vessels as the *Kearsarge* and the *Ranger.* Portsmouth was settled in 1623, and was within the limits of Massachusetts until New Hampshire was organized in 1679; and it was the capital of New Hampshire until 1807. It ranks high as a summer resort, and is also of industrial importance, its manufactures including shoes, buttons, and lumber. The city was the home of Gov. Benning Wentworth, and his nephew Gov. John Wentworth, James T. Fields, Gen. Fitz John Porter, Tobias Lear, private secretary to George Washington, and Thomas Bailey Aldrich. The treaty concluding the Russo-Japanese War was signed at Portsmouth in 1905. Population in 1920, 13,569.

Portsmouth, Ohio, an industrial city and the county seat of Scioto County, is at the junction of the Scioto and the Ohio rivers, and is the southern terminus of the Ohio Canal. It is 100 miles south of Columbus, on four railroads. Portsmouth is in a bountiful agricultural region, and valuable deposits of fire clay are found near the city. Chief among its manufactures are paving, building and fire bricks, cars, stoves, ranges, furniture, shoes, steel and veneer. The city has modern schools, and libraries, fine municipal buildings, a Federal building and several parks. Nearby are interesting remains of the ancient Mound Builders. In 1920 the population was 33,358.

Portsmouth, Va., an industrial city and the county seat of Norfolk County, is on the western or mainland side of the Norfolk-Portsmouth harbor. It is served by seven railroads, three of which—the Atlantic Coast Line, the Southern and the Seaboard Air Line—have their deep water terminals here. The United States Navy Yard, with dry docks and a plant for the construction of steel ships, is located here, together with the naval training station, naval magazine and the United States Naval Hospital. Important among the city's manufactures are cotton-seed oil products, talcum powder, soap, excelsior, butter dishes, sash, doors and blinds, knit goods, hosiery, blotting paper, dyes and creosoted conduits. A large trade is carried on in fish, crabs and oysters and a vegetable canning factory is located in the city. The city has modern schools, a public library, an armory and handsome municipal buildings. Population in 1920, 54,387.

Portugal, pōr′tū-gal, a republic of Europe. It occupies the most southwesterly part of the Spanish peninsula, lying between Spain and the Atlantic Ocean. Although geographically it is a natural part of Spain, it has never been united closely with that country. The boundary between the two is the eastern limit of heavy Atlantic rains. It is a natural faunal and floral boundary. From the eighth to the twelfth centuries Portugal was occupied by the Saracens or Moors. At the beginning of the great period of maritime discovery Portugal was the leading seafaring nation of western Europe. Portuguese explorers, among whom Vasco da Gama was first, found the way around southern Africa to the East Indies and laid also the foundation of extensive Portuguese claims in South America. Brazil was a Portuguese possession until 1822.

TOPOGRAPHY. In shape Portugal is oblong. Its greatest length from north to south is about 345 miles. Its greatest breadth is 140. It has an area of 35,490 square miles, the Azores and Madeira Islands included. Lisbon, the capital, is the largest city. Oporto is the chief port. The surface rises from the coast rapidly. The interior is mountainous. The ranges include many fertile, well watered valleys. The Douro and the Tagus are the chief rivers. The mountains are, at foundation, granite. The mineral wealth consists chiefly of lead, iron, cobalt, slate, lithographic stone, millstones, and kaolin. Gold has been found in small quantities. There are salt and mineral springs.

Climate and Products. The air is pure. Spring appears in February. July is usually a season of drouth. Toward the end of September, the fall rains set in, producing a second season of verdure and flowers, so that Portugal is said to have two springs. The chief industry of the country is agriculture. Twenty-two acres out of 1,000 are under vineyards; 72 under fruit trees; 125 in grain; 27 in peas and similar crops; 267 in pasture and fallow; 29 under forests; and 455 are waste lands. Valuable mines remain unworked. Considerable cork oak is raised. Large droves of swine maintain themselves in the forests, living on acorns. Indian corn, rice, wheat, olives, figs, tomatoes, oranges, onions, and potatoes are important food crops. Cattle and sheep are raised.

Wine, cork, and fish are the most important exports. Sheep and olive oil come next in order of importance. A great many eggs are exported. The country has 1,742 miles of railway, of which the state owns a little more than one-third. The country is covered by a complete system of telegraph and telephone lines. The national coin is the milreis, worth rather more than a dollar of our money. The unit of weight is the libra, a trifle greater than our pound avoirdupois.

Possessions. Although Portugal has lost Brazil, it still has important possessions in Africa and Asia. The African possessions have a total area of 927,292 square miles and a population of 8,000,000. The Asiatic possessions in India, the Indian Archipelago, and China have an area of about 9,000 square miles and a population of somewhat less than a million. Goa is the seat of Portugese trade in India. Macao, on a small island of the same name at the mouth of the Canton River, is the seat of Portugese trade with China.

Population. The population of Portugal is approximately 5,960,000, an average of 157.6 per square mile. About three-fifths of the people are engaged in agriculture and one-fifth in manufactures and commerce. Lisbon, the chief city, has a population of 489,667; Oporto, 203,981. Several other cities have a population between 10,000 and 25,000.

Education, Etc. The Roman Catholic faith is the state religion. All forms of worship are tolerated. In 1844 a system of common school education was established. Although attendance is nominally compulsory on the German plan, it is nevertheless irregular. Less than one-fourth of the people are able to read. A system of normal schools and secondary schools has been established. There are several institutions of higher learning, including schools of engineering, medicine, agriculture, a naval school, a school of fine arts at Lisbon, and another at Oporto. The national university, now at Coimbra, was founded in 1290. It has severel faculties and an attendance of 1,684 students.

Government. The government of Portugal until 1910 was a constitutional monarchy. In that year a revolution took place, the monarchy was overthrown, and King Manuel II was forced to flee. A provisional government was established until such time as a republican constitution could be drawn up. June, 1911, the Constituent Assembly met and began work on a form of government. The proposed plan provided for a two-chambered legislature; the first chamber being called the National Council, its members elected by the people to hold office for three years; the second chamber, the Council of Municipalities, to be chosen by the municipal councilors of the various cities, half to be elected every three years. These two chambers constitute the Congress, and together they elect the president for five years. He is assisted by a cabinet.

History. The Carthaginians and Phoenicians colonized the coast of Portugal, and later the Greeks and Romans did likewise. The country was subjected by the Visigoths in the fifth century, and three centuries later the Moors appeared. Under the latter Portugal was prosperous until the decline of Moorish power in the tenth century. During the Christian-Moor wars of the eleventh century, when Henry of Bergundy was created by Anfonso IV of Spain first count of Portugal, does authentic Portugese history begin.

From 1095 to 1325 the state was torn by petty wars, but after the latter date great strides forward were made, and under

Henry the Navigator (which see) the Portugese won world renown as explorers. Manuel the Fortunate came to the throne in 1495, but after the close of his reign in 1554, Portugal rapidly declined. The Inquisition (which see) had a stultifying effect, and not until the late seventeenth century did a real revival begin.

At the time of the French Revolution Portugal was allied with England, and as a result was occupied by French troops. The latter the English expelled in 1808, and in 1821 John VI returned from Brazil, whither he had fled. Internal troubles ensued and did not end until 1910, when the rebellious people expelled King Manuel, set up a provisional government, and adopted the present constitution.

In 1916 Germany declared war on Portugal, and mobilization at once began in the latter state. By July, 1917, 40,000 Portugese troops were fighting in France and continued active until the armistice was signed.

In 1917 a revolution against the government of the Democrats began; President Machado was arrested and expelled from the country, and a new government was established. Later, other outbreaks occurred, but after 1920, save for several rather serious strikes, little of importance had occurred to 1923.

STATISTICS. The following statistics are the latest to be had from trustworthy sources:

Area, square miles	35,490
Forest area, square miles	6,033
Population	5,957,985
Chief cities:	
Lisbon	489,667
Oporto	203,981
Setubal	30,346
Madeira	24,687
Braga	24,647
Coimbra	20,581
Number of counties	11
Members of senate	71
Members of house of representatives	164
National revenue	$130,000,000
Bonded indebtedness	$185,000,000
Farm area, acres	
Wheat, bushels	4,767,665
Oats, bushels	3,037,831
Rye, bushels	1,785,838
Barley, bushels	1,009,780
Wine, gallons	96,641,160
Wool, pounds	6,244,684
Cork, pounds annually	176,225,000
Olive oil, gallons annually	12,750,000
Domestic animals:	
Cattle	700,000
Sheep	3,800,000
Swine	1,000,000
Fisheries products, value	$20,205,996
Imports	$716,589,100
Exports	$20,578,235
Copper ore exported, value	$821,783
Salt exported, value	$122,763
Miles of railway	2,128
Number of public schools	7,039
Pupils enrolled	182,206

Portuguese East Africa, formerly called Mozambique, is the second largest of Portugal's colonies, having an area of 428,132 square miles. It is bounded by Tanganyika Territory, north; Indian Ocean, east and south; and Rhodesia, west. The name Mozambique is now reserved to the northeastern section. The population is estimated at 3,150,000 natives and 10,500 white Europeans. By the terms of the Treaty of Versailles that part of former German East Africa known as the Kionga Triangle has been incorporated as a part of the Portugese colony. The largest city and chief port of the colony is Mozambique, with 363,000 inhabitants.

The Zambezi River divides the colony into two almost equal sections and affords a good transportation route. The colony is malarial, and for that reason development has been somewhat backward. The principal products are copra, sisal, sugar cane, ivory, rubber, ground nuts and beeswax. Coal has been found in paying quantities and gold is mined on the Upper Zambezi. Cereals, cement, cotton, alcoholic liquors and foodstuffs are the principal imports, while ivory, rubber, sugar, wax and ore are the important imports. Beira and Tho are next in importance to Mozambique as ports. The colony has about 200 miles of railroads, and approximately 600 miles of highways, with more of each in prospect.

The economic condition of this possession has been greatly improved since 1910; the agricultural and mining industries have shown progress and commerce has increased, but until the drainage to combat malaria has been undertaken the colony will not reach the height of productivity.

Portuguese Guinea, a Portuguese colony of west Africa, is on the coast of Senegambia, but includes also the archipelago of Bijagoz. The area is 13,940 square miles and the population is estimated at 289,000. The principal products are rubber, hides, wax, oils, ivory and hardwoods, but the natural resources of the colony are very valuable and will, under proper exploitation, prove a valuable source of revenue to the home country. The only port, Bulama, is on the island of Bulama, which is situated at the mouth of the Comba River.

Portuguese Literature. See LITERATURE.

Portulaca, a genus of plants, so named by the botanist Tournefort. There are about twenty species, chiefly tropical. All are fleshy herbs, prostrate or ascending, with thick juicy leaves. The ovary is one-celled and contains a mass of small, shiny seeds. The garden portulaca has showy terminal flowers, red, yellow, purple, and variegated. They open in bright sunshine and close on the approach of a shower or at eventide. The common purslane is known to botanists as *Portulaca oleracea.* It is a common weed in American gardens. It is capable of resisting drouth, and, even when cut off by the hoe, it will root again if left on moist earth. The flowers of this species are inconspicuous. Other members of the portulaca family are the Claytonia, or spring beauty, and the bitter root, or Lewisia, of the Rocky Mountains. A related shrub of Cape Colony is known as the purslane tree. Related species from California, Peru, and Australia are known to the horticulturist as Calandrinia.

Port Wine. See OPORTO.

Poseidon, po-sī′dŏn, one of the Greek divinities. He was a brother of Zeus, Hades, Hera, Hestia, and Demeter. The rule of the sea fell to him by lot. His palace was in the depths of the Aegean, near Euboea. Here he kept his horses with brazen hoofs and golden manes. With these horses, in time of storm, he drove in a chariot over the waves which became smooth as he approached. The monsters of the deep recognized his sovereignty and sported about his chariot. See NEPTUNE; AMPHITRITE.

Positivism. See COMTE, AUGUSTE.

Postal Information. The following is compiled from a pamphlet issued by the postoffice department:

compiled from statistics issued by the postoffice department:

DOMESTIC RATES.

First-Class Matter.

Rates of postage—Letters and other first-class matter 2 cents for each ounce or fraction thereof. Postcards and postal cards, 1 cent each.

"Drop letters," addressed for delivery at the office where mailed, 2 cents for each ounce or fraction thereof when deposited at postoffices where letter carrier service is not established. There is no drop rate on mail other than letters.

Airplane mail, first-class only, 2 cents an ounce. Special stamps not required.

The limit of weight of first-class matter is four pounds.

First-class matter includes written matter, namely, letters, postal cards, postcards (private mailing cards) and all matter wholly or partly in writing, whether sealed or unsealed (except manuscript copy accompanying proof sheets or corrected proof sheets of the same and the writing authorized by law on matter of other classes). Also matter sealed or otherwise closed against inspection.

Second-Class Matter.

Rates of postage—Newspapers and periodical publications of the second class, when sent unsealed by others than the publisher or a news agent, 1 cent for each four ounces or fraction thereof on each separately addressed copy or package of unaddressed copies.

Second-class matter includes newspapers and periodicals bearing notice of entry as second-class matter. No limit of weight is prescribed.

On and after July 1, 1918, the rate of postage on publications entered as second-class matter, when sent by the publisher or a news agent to subscribers or to other agents for the purpose of sale, on the portion of a publication devoted to other matter than advertisements, shall be 1¼ cents per pound or fraction thereof until July 1, 1919; after that 1½ cents per pound or fraction thereof; on the portion of a publication devoted to advertisements the rates per pound or fraction thereof for delivery within the several zones devoted to fourth class matter shall be: From July 1, 1918, to July 1, 1919, for the 1st and 2d zones, 1¼ cents; 3d zone, 1½ cents; 4th zone, 2 cents; 5th zone, 2¼ cents; 6th zone 2½ cents; 7th zone, 3 cents; 8th zone, 3¼ cents; between July 1, 1919, and July 1, 1920, for 1st and 2d zones, 1½ cents; 3d zone, 2 cents; 4th zone, 3 cents; 5th zone, 3½ cents; 6th zone, 4 cents; 7th zone, 5 cents; 8th zone, 5½ cents; from July 1, 1920, to July 1, 1921, for 1st and 2d zones, 1¾ cents; 3d zone, 2½ cents; 4th zone, 4 cents; 5th zone, 4¾ cents; 6th zone, 5½ cents; 7th zone, 7 cents; 8th zone, 7¾ cents; after July 1, 1921, for the 1st and 2d zones, 2 cents; 3d zone, 3 cents; 4th zone, 5 cents; 5th zone,

6 cents; 7th zone, 9 cents; 8th zone, 10 cents.

In the case of newspapers entitled to be entered as second-class matter and published in the interest of religious, educational, scientific, philanthropic, agricultural, labor or fraternal organizations, not organized for profit, the rates, irrespective of the zone in which delivered (except where the same are deposited in a letter carrier office for delivery by its carrier, in which case the old rate prevails), shall be 1⅛ cents a pound or fraction thereof between July 1, 1918, and July 1, 1919, and after that 1¼ cents.

Third-Class Matter.

Rate of postage—On unsealed third-class matter the rate is 1 cent for each two ounces or fraction thereof on each individually addressed piece or package.

Third-class matter embraces circulars, newspapers and periodicals not admitted to the second class, nor embraced in the term "book," miscellaneous printed matter on paper not having the nature of an actual personal correspondence, proof sheets, corrected proof sheets and manuscript copy accompanying the same, and matter in point print or raised character used by the blind. (Books are included in fourth-class or parcel post mail.)

The limit of weight of third-class matter is four pounds.

Zones—Parcel Post Guide and Maps.

For parcel post purposes the United States is divided into units of area thirty minutes square. Such units form the basis of the eight postal zones. To ascertain in which zone a postoffice is located from the office of mailing, a parcel post guide, costing 55 cents, and map, costing 20 cents, are jointly used. The guide applies to all offices, but a separate map is required for each unit. A zone key is furnished with the guide for use in the units of area in which some of the largest postoffices are located, and makes the map for those units unnecessary. The guide and maps may be purchased by sending a money order to the third assistant postmaster-general, Washington, D. C. Stamps are not accepted.

Insurance of Fourth-Class Mail.

Fees and conditions—Fourth-class or domestic parcel post mail (but no other) may not be registered but may be insured against loss in an amount equivalent to its actual value, but not to exceed $5 in any one case, on payment of a fee of 3 cents; not to exceed $25 on payment of a fee of 5 cents; not to exceed $50 on payment of a fee of 10 cents; or not to exceed $100 on payment of a fee of 25 cents, in addition to the postage, both to be prepaid by stamps affixed.

Collect-on-Delivery Service.

Conditions and fee—Parcels of fourth-class or parcel post matter (but no other) may be sent C. O. D. from one domestic money order postoffice to another, including those in the Canal Zone, on payment of a fee of 10 cents in addition to the postage, both to be prepaid with stamps affixed. The amount to be collected and remitted to the sender must not exceed $100. The remittance is made by postoffice money order, the fee therefor being included in the amount collected from the addressee. A C. O. D. tag furnished by the postmaster must be filled in by the sender and attached to the parcel. The C. O. D. fee also covers insurance against loss up to $50.

Postal Cards.

Postal cards are furnished at the postage value represented by the stamp impressed thereon; single postal cards for domestic and foreign correspondence at 1 cent and 2 cents each, respectively, and reply (double) postal cards at 2 cents and 4 cents each, respectively.

Special Delivery Service.

Special delivery service is the prompt delivery of mail by messenger during prescribed hours to persons who reside within the carrier limits of city delivery offices, to patrons of rural service who reside more than one mile from postoffices but within one-half mile of rural routes, and to residents within one mile of any postoffice.

This service is obtained by placing on any letter or article of mail a special delivery stamp or 10 cents' worth of ordinary stamps in addition to the lawful postage. When ordinary stamps are used the words "Special Delivery" must be placed on the envelope or wrapper, directly under but never on the stamps; otherwise the letter or article will not be accorded special delivery service.

Registry System.

Any matter, properly addressed and bearing the name and address of the sender, admissible to the domestic mails (except fourth-class mail, which may be insured), or to the postal union mails (except foreign "parcel post" packages for Barbados, Curacao, Dutch Guiana, France, Great Britain, Guadeloupe, Martinique, the Netherlands and Uruguay), may be registered. Foreign "parcel post" mail must be taken to the postoffice to be registered, but other mail may be registered at any postoffice or postoffice station by rural carriers, and, when sealed and not cumbersome, by city carriers in residential districts.

The registry fee for each separate article, foreign or domestic, is 10 cents in addition to the postage, both to be fully prepaid.

Indemnity for lost registered mail will be paid as follows:

Domestic mail, first class (sealed), up to $50, actual value; third class (unsealed), up to $25, actual value.

Foreign mail, amount claimed within limit of 50 francs ($9.65), for total loss (not partial loss of rifling) of a registered article exchanged between the United States and a postal union country, except foreign parcel post matter, and losses beyond control ("force majeure").

Application for a money order must be made on a form furnished for that purpose and be presented at the money order window of the

postoffice or one of its stations. Money orders are issued for any desired amount from 1 cent to $100 and when a larger sum than $100 is to be sent any number of additional orders may be obtained. Applications may be made through rural carriers, who will furnish the necessary forms and give receipts for the amounts.

International money orders, payable in almost any part of the world, may be obtained at all of the larger postoffices and at many of the smaller ones.

Fees for money orders payable in the United States (which includes Hawaii, Porto Rico and the Virgin islands) and its possessions, comprising the Canal Zone, Guam, the Philippines and Tutuila, Samoa; also for orders payable in Bermuda, British Guiana, British Honduras, Canada, Cuba, Mexico, Newfoundland, at the United States postal agency at Shanghai (China), in the Bahama islands and in certain other islands in the West Indies:

For orders from	$ 0.01	to	$ 2.50	3 cents
For orders from	2.51	to	5.00	5 cents
For orders from	5.01	to	10.00	8 cents
For orders from	10.01	to	20.00	10 cents
For orders from	20.01	to	30.00	12 cents
For orders from	30.01	to	40.00	15 cents
For orders from	40.01	to	50.00	18 cents
For orders from	50.01	to	60.00	20 cents
For orders from	60.01	to	75.00	25 cents
For orders from	75.01	to	100.00	30 cents

The fees for foreign money orders payable in any country on which a money order may be drawn, other than those named above, may be ascertained upon inquiry at the postoffice.

FOREIGN MAIL MATTER.

Rates of Postage.

The rates of postage applicable to articles for foreign countries are as follows: Cents.

Letters for Canada, Cuba, Mexico, Republic of Panama, city of Shanghai (China), England, Ireland, Newfoundland, Santo Domingo, Scotland, Wales, the Bahamas, Barbados, British Guiana, British Honduras, Dutch West Indies, Leeward islands, New Zealand, Trinidad (including Tobago) and the Windward islands (including Grenada, St. Vincent, the Grenadines and St. Lucia), Bolivia, Colombia, Honduras, Nicaragua and Peru, per ounce	2
Letters for Germany by direct steamers, per ounce	2
Letters for all other foreign countries, and Germany when not dispatched by direct steamers:	
For the first ounce or fraction of an ounce	5
For each additional ounce or fraction of an ounce	3
Single postcards (including souvenir cards), each	2
Reply postal cards, each	4
Printed matter of all kinds, for each two ounces or fraction of two ounces	1
Commercial papers, for the first ten ounces or less	5
For each additional two ounces or fraction of two ounces	1
Samples of merchandise, for the first four ounces or less	2
For each additional two ounces or fraction of two ounces	1
Registration fee in addition to postage	10

Foreign Parcel Post.

Postage rate—Postage must be prepaid in full by stamps affixed at the rate of 12 cents a pound or fraction of a pound. Registry fee 10 cents in addition to postage.

Dimensions—to all countries named packages are limited to three and one-half feet in length and girth combined, except that packages for Colombia and Mexico are limited to two feet in length and four feet in girth.

Weight—Packages to certain postoffices in Mexico must not exceed four pounds six ounces in weight, but those for all other countries named may weigh up to but not exceeding eleven pounds.

United States Postal Statistics

RECEIPTS AND EXPENDITURES.

Year	Revenue.	Expenditures.
1850	$ 5,499,984.86	$ 5,212,953.43
1860	8,518,067.40	19,170,609.89
1870	19,772,220.65	23,998,837.63
1880	33,315,479.34	35,542,803.68
1890	60,882,097.92	66,259,547.84
1900	102,354,579.29	107,740,267.99
1910	224,128,657.62	229,977,224.50
1911	237,879,823.60	237,648,926.68
1912	246,744,015.88	248,525,450.08
1913	266,619,525.65	262,067,540.33
1914	287,934,565.67	283,558,102.62
1915	287,248,165.27	298,546,026.42
1916	312,057,689.00	306,204,033.00
1917	329,726,116.00	319,889,905.00
1918	388,975,962.24	324,833,728.47
1919	436,239,126.20	362,497,635.69
1920	437,150,212.33	454,322,609.21
1921	463,491,274.70	620,993,675.65
1922	484,853,540.71	545,668,941.07

See PARCEL POST.

Postal Savings Banks, a savings bank system organized by the government and conducted through the postoffices. Bankers very generally are credited with opposition to the system on the score that ordinary bank deposits would decrease. The chief arguments offered in favor are:

1. SECURITY. As a rule, private savings banks are conducted with care, but the occasional failure occurs often enough and is bruited sufficiently to destroy that degree of confidence which is essential. Of course there are banks, and there are savings

banks; but workingmen are not in position to discriminate. They only know that "Uncle Sam" can be depended upon. Even though governmental affairs are not conducted with an eye single to the interest of the common people, wage earners have more confidence in the stability of the government than in any other organization.

2. Convenience. We have postoffices everywhere. Depositing could be made as convenient as buying postage stamps. People fall into a new plan if it is easy to do so. No private system of banks can afford to maintain an agency in every hamlet and send agents with carts along country roads daily. At present we have whole counties without facilities for saving the driblets.

3. Increased Deposits. Many a dollar is hoarded that would be brought out and put into circulation if the hoarder knew where it could be put and be sure of getting it back again when he wants it. The harder the times and the greater the need of money to carry on business, the more apt the fearful are to stow it away "in a stocking."

4. Formation of the Saving Habit. It is notorious that Americans are wasteful. The possession of a savings account leads naturally to increasing it. To him that hath comes the desire to have more. A few dollars in the bank means a few pennies saved today and more tomorrow. The people of the United States are making money because of great natural resources. They use soil, forests, coal, that nature has provided. European conditions are coming upon us rapidly. We ought to dig up and revive the ideas of such men as Benjamin Franklin. A national crusade in favor of savings and thrift may avert distress later

5. Funding the Public Debt. It is believed that if given an opportunity the American people would loan the government enough to take up the issues of bonds now held largely by capitalists. If savings deposits were exchangeable for interest-bearing bonds in small denominations—five or ten dollars—it is believed the entire public debt, Panama bonds as well, would be absorbed.

6. Economy of Administration. The expense of installing the system would not be great. The present cost of handling money orders is not excessive. Canada adopted the postal savings system in 1867. From the first the cost of operation was low, and the government has not relaxed its effort to popularize the postal banks. The government with thousands of postmasters and clerks already under employ can handle savings at far less additional expense for salaries than is possible in the case of private banks.

7. Greatest Good to the Greatest Number. Some writers are of the opinion that strong private savings banks would not be injured; others that they would be starved out of existence. In either case, the national system commends itself because the welfare of millions is of more importance than that of a few hundred bankers able to take care of themselves.

As in many other reforms, Great Britain led the way. In 1861 the British people were given an opportunity to deposit their savings in the postoffices. Today ten millions of them are doing so. The plan has been taken up by country after country until it has swept the world. Far off Japan has adopted it; New Zealand is in line; Tasmania, Hawaii, and Finland have postal savings banks. The following is a list of countries having postal savings banks, together with the number of depositors and the amounts deposited. Some other countries of Europe have postal savings banks, but post bellum conditions preclude the compilation of accurate statistics.

Country	Depositors	Deposits
Argentina	312,383	$ 7,882,158
Egypt	224,760	3,961,419
Finland	104,062	1,051,521
France	6,908,854	194,119,692
Tunis	1,883	1,416,199
Italy	6,273,500	547,211,842
Japan	20,088,713	301,832,170
Formosa	358,204	2,750,812
Chosen	1,406,259	7,440,556
Netherlands	1,887,362	107,811,734
Dutch East Indies	182,348	5,602,219
Dutch Guiana	12,211	409,047
Dutch West Indies	4,793	101,229
Spain	325,144	14,745,821
Sweden	661,686	22,607,418
United Kingdom	15,215,824	989,174,810
British India	1,677,407	61,072,871
New Zealand	630,783	147,813,554
Canada	116,541	41,654,920
Union of South Africa	306,103	33,933,496

United States	466,109	152,389,903
Philippines	110,574	3,052,844

Postal savings banks were established in the United States in 1910 and they have been the means of bringing millions of dollars into circulation. Anyone ten years of age or over can open an account in his or her name by depositing one dollar or any multiple of that sum; one cannot deposit over $100 in a month and one's deposit cannot exceed $1,000. When this sum is reached, the depositor may convert it into government bonds paying the same rate of interest. Smaller deposits may be converted into government bonds by applying to the Secretary of the Treasury.

Post-Impressionism, an artistic term denoting the form of reaction taken by painters after the period of impressionism. The revolt was two-fold—against the painting of light and transparency, and the creation of specific objects or things. The post-impressionist believes in the painting of moral, open subjects, unmarked by the presence of nature and presented in an abstract and psychological manner. Very often strictly natural objects do not make their appearance at all in a genuine post-impressionistic production.

The impressionists believed in painting or moulding objects exactly as they are first noted by the eye. Form did not enter into their creations. They considered only light, which they interpreted in a few colors, used at all times. Certainly they brought out all the splendid possibilities of light.

The post-impressionists, however, while realizing that light is an influence, maintain also that form—portrayal of feelings and ideas, has far more depth to it than the blurred outlines of a conception. They, therefore, proceed to build upon problem pictures—with much color and meaning in the conception.

Out of this movement arose the cubists and the futurists. The former painted geometric objects and lines, while futurists believe in literally shocking the motive into the consciousness of the audience. This they accomplish by weaving into the picture all the forces which enter into the struggle for existence of the object.

There is a school of German post-impressionists who cling to the teachings of the old masters. The movement is a comparatively modern one.

In 1913 the International Association of American Sculptors and Painters was held in Chicago, at which time the post-impressionistic movement held a very conspicuous place. At this time many American artists and sculptors were wholly or partially won over.

Postoffice, an office for the reception, delivery, and transmission of mail. A postoffice was originally a station at which horses and men were posted to relieve each other in the carrying of government dispatches. Even in Scriptural times, relays of carriers were arranged to forward messages with all possible speed from outlying provinces to the various capitals. Scriptural references are numerous. Job says, "Now my days are swifter than a post. They flee away." In Jeremiah li: 31, we find, "One post shall run to meet another, and one messenger to meet another, to sh the king of Babylon that his city is t n at one end."

Cyrus the Great had a complete stem of messengers. Saddled horses st ready at a day's journey apart to ca him tidings from the remotest portion of his empire. The excellent military roads which extended toward each part of the empire enabled the Roman courier to make good time. All the earlier postal systems were intended primarily for the transmission of government reports. Private persons depended on special messengers or intrusted their communications to travelers going that way. The emperor Diocletian is praised for permitting government couriers to carry letters for private parties. Charlemagne maintained a postal service between the larger cities of his extensive empire. The earlier universities of Europe appear to have had postal systems of their own. Beginning with the thirteenth century, the University of Paris had a regular system of carrying letters and moneys for its students to and from all parts of the civilized world.

The early introduction of the public postal system is credited usually to France. A public system of posts was founded June 19, 1464, by an edict of Louis XI. It cov-

TRANSCONTINENTAL AIR MAIL

ered the principal roads of the empire. Within the next 100 years we find that similar systems were set in operation in Spain, Germany, and Great Britain. In 1522 the Emperor Charles V established a postal system extending from the Netherlands to Italy.

The postal system of Great Britain is of especial interest to Americans. With the accession of James I to the English throne, communication between England and Scotland became more frequent. In 1603 the lawful charge for horses for the use of those riding post haste was fixed at five cents a mile. The keeper of each post was required to have no less than two horses in readiness for the conveyance of government dispatches. These letters were not to be detained at any post above a quarter of an hour. The riders were to set forth at the rate of seven miles an hour in summer and five miles in winter. In 1635 a public post was established between London and Edinburgh. The schedule was three days. At the same time other routes were established to Wales, Ireland, and to parts of England, in all eight main routes. The charge for a letter was fixed at from four cents to sixteen cents according to distance, the latter charge paying the postage on a letter from London to Edinburgh. Private messengers were prohibited from competing with the government service.

At this date the postal system was looked upon rather as a possible source of revenue than otherwise. We find, for instance, in 1653, that a John Manley paid the government $40,000 a year for the privilege of carrying the mails and collecting the postage. It is also interesting to note that it was not until 1663 that a proclamation was issued commanding that "no postmaster or other officer that shall be employed in the conveying of letters or the distributing of the same, or any other person or persons, except by the immediate warrant of our secretaries of state, shall presume to open any letters or packets not directed to themselves."

In 1784 a system of carrying letters by means of mail coaches was put into operation. Special vehicles were built. They were accompanied by guards for the greater security of mail. During the first twenty years of the English mail coach system the gross yearly income of the postoffice department grew from $2,000,000 to about $6,000,000. The next great improvement was the postal reform of the period from 1836 to 1842. Briefly stated, the charge for letters was made uniform between any two postoffices of Great Britain and Ireland. A low rate of one penny or two cents per letter was adopted. The abuse of the franking privilege was curbed. During the next two decades the number of letters grew by leaps and bounds from 75,000,000 in 1840 to 504,000,000 in 1857. In other words, cheap postage multiplied the number of letters by six fold during eighteen years.

As early as 1792, primarily in order to transmit small sums for soldiers and sailors, a money order system was added. Savings banks were established in connection with the British postoffice in 1861. Within two years' time there were 319,669 postoffice depositors with total deposits of over $80,000,000. In twenty years' time the total deposits, made chiefly by wage earners, rose to $2,000,000,000. It may be said in passing that a similar system in France assisted the French government materially in paying off its enormous war indemnity to Germany. In 1882 the British postal system undertook to pay annuities and to insure life.

In 1868 an act of Parliament authorized the postmaster general to purchase such telegraph lines as might be required and to take over the telegraphic system of the country. The telegraphic companies very naturally placed every possible obstruction in the way of the transfer of the business. Within six years the government controlled 63,000 miles of wires. The number of messages rose rapidly from 6,000,000 to 20,000,000. Still another undertaking of the British postoffice was the management of a parcel post system. The rural letter carrier is now everywhere provided with a horse and van for the carrying of parcels, valises, game, baskets of bread, butter, cheese, laundry, and fruit. The thousand and one different articles that in this country are sent by express are transmitted through the British postoffice at nominal expense. The revenue from thickly settled parts of the country, where parcels are

numerous, helps to pay the expense of sending carts through the more sparsely settled sections. In a recent year the British postoffices handled 2,579,500,000 letters, 488,000,000 post cards, 810 book-packets, 175,000,000 newspapers, and 90,000,000 express parcels.

The first postoffice in the United States was opened in Boston in 1639. The General Court sent out this proclamation:

> It is ordered that notice be given that Richard Fairbanks, his house in Boston, is the place appointed for all letters, which are brought from beyond the seas, or are sent thither, to be left with him, and he is to take care that they are to be delivered or sent according to direction: and he is allowed for every letter a penny, and he must answer all miscarriages through his neglect in this kind.

Virginia established a postal service in 1657. New York established a monthly mail between New York and Boston in 1672. The first regular mail carrier on the American continent set out on horseback from New York on New Year's Day for Boston. He rode *via* Stamford, New Haven, Hartford, and Springfield. Once a month this postman made the trip by ferry, ford, and bridle path. On his return he emptied his bag on the table of a coffee-house.

Immediately on arriving at Philadelphia William Penn established a postoffice with weekly mail to Maryland and to various settlements near by. In 1691 a Thomas Neale was granted royal authority to establish an American postal system for what he could get out of it. Neale's postal service began May 1, 1693. It extended from Portsmouth, New Hampshire, to Virginia. The entire route was divided into five stages. Mails were carried weekly. The route was under the general supervision of the London postoffice. In 1707 the British postoffice purchased the rights of the American proprietors. Mails appear to have been carried between the principal coast cities weekly or fortnightly. In 1737 Benjamin Franklin was made postmaster at Philadelphia. The English deputy postmaster for the colonies had much confidence in Franklin's sagacity and took his advice in introducing improvements in the service. In 1752 Franklin was himself appointed American postmaster-general, a position which he held until the outbreak of the Revolutionary War.

One of the first steps of the Second Continental Congress was to establish a colonial system of mails. Franklin was placed in charge until other more important duties took him away. His salary was $1,000 a year. A main route was laid out from New Hampshire to Georgia, with such branch lines as were deemed necessary. Up to 1799 the penalty for robbing the mails was death. In that year flogging was substituted, a punishment which has since given way to imprisonment. Sunday delivery of mails was begun in 1810. It met with the most strenuous protest. Various religious bodies passed resolutions condemning the practice vigorously. The horse and rider and mail coach were supplemented in 1813 by steamboats.

In the earlier years of our national postal service the charge for letters was from eight to twenty-five cents, according to distance. In 1845 a new scale was adopted: under thirty miles, six cents; under eighty miles, ten cents; under one hundred and fifty miles, twelve and one-half cents; under four hundred miles, eighteen and three-fourths cents; maximum charge, twenty-five cents. Further reductions came gradually. The next rate established was five cents for distances not exceeding three hundred miles, and ten cents for greater distances. In 1851, the rate was reduced to three cents under three thousand miles and ten cents for greater distances. In 1863 a uniform rate of three cents for all distances was made. Two cent postage came in the year 1883. Postal cards were authorized in 1873. The system of registering letters was adopted in 1853. The fee was at first five cents. It was raised to twenty cents during the Civil War, but has since been fixed at ten cents.

In 1825 authorized carriers were permitted to deliver letters at homes and offices at a special charge of two cents each, to be collected from those to whom the letters were addressed. In 1836 these carriers were permitted to deliver newspapers and pamphlets and to collect a special charge of half a cent each. In 1863 the present system of free delivery was introduced into all cities having a poulation of 50,000 or

over. The present basis is the amount of postal business rather than the population. Rural free delivery, or delivery by wagon in rural districts, was established in 1897. Forty-four routes were laid out as an experiment. In 1903 Congress made an appropriation of $8,054,400. Since that date the number of routes has increased rapidly.

Our present system of sending small sums by postal money orders originated in 1864. Like the British system it was intended originally to accommodate soldiers and their friends. Only a few offices were permitted at first to issue orders. It has proved so popular, however, that, in 1909, 69,304,395 domestic and 3,175,014 foreign money orders were issued. The sum transmitted in this way reached the enormous total of $567,829,646 for the year.

Railway postoffices were adopted in England before they were in this country. In 1864 cars were fitted up by our leading railways with facilities for postal clerks, enabling them to sort and bag mail for immediate delivery. When a trainload of mail reaches New York, for instance, it is not necessary to send it to the central postoffice to be sorted. Train clerks have already placed it in bags marked with the destinations. Some bags go aboard steamers, others are placed on trains. Even mail for the postal sub-stations of the cities is sent direct from the railroad station. Mail cars also receive mail from private parties. Merchants desiring to mail letters too late for the postoffice are permitted to take their mail direct to the train. There are now over 10,000 postal clerks employed on trains and boats. Between 4,000 and 5,000 cars and apartments are used in the service. To avoid the frequent calls made for compensation by relatives of clerks who are killed in the railway service, Congress has made a standard appropriation and authorizes the payment of $1,000 to the legal heirs of those who lose their lives. Air mail routes have been established between New York and Chicago and New York and San Francisco. Now that the plan has been started, other routes probably will follow.

The postal system of the United States is under the general supervision of the postmaster-general. Since 1829 he has been a member of the president's cabinet. His department is divided into four bureaus, each bureau under the supervision of an assistant postmaster. One bureau has charge of the carriers and all matters pertaining to the delivery of mail; a second bureau looks after the transportation; the third bureau handles the postage and keeps all accounts; the fourth bureau looks after the appointment of postmasters and inspects their work.

United States Postoffice Statistics, 1920.

Number of postoffices	52,638
Revenue of the department	$437,150,212
Expenditure of the department	$454,322,609
Compensation to postmasters	$40,108,079
Transportation of mail	$99,519,598
Domestic money orders	$1,332,699,836
International money orders	$32,960,048
Value of stamps on hands, June 29, 1920	$218,143,770
Rural delivery routes	43,453
Mileage of rural delivery routes	1,143,467

It is said that, placed end to end, the stamps canceled in American offices annually would girdle the earth five times.

An interesting feature of the postoffice department at Washington is the dead letter office. It was established in 1825. It is the duty of local postmasters to advertise all letters uncalled for. At the expiration of a certain length of time, usually three months, they are sent to the dead letter office. All misdirected letters and parcels, whose senders have neglected to write their own addresses, are sent here also. About 7,000,000 pieces reach this office a year. About 5,000,000 of these are unclaimed letters. Half a million letters are returned to foreign countries annually. A force of clerks is employed opening letters and packages, to the sender's address of which there is no outside clew. Many thousands of dollars in money, drafts, and notes are in this way returned to the sender. After the office has done its best to return the property, there is still a vast quantity of merchandise of all descriptions. It is disposed of periodically at public auction.

In 1874 an international congress was held at Berne for the purpose of forming a postal union. According to arrangements proposed at that time, and since ratified by other governments, postage may be prepaid on letters to all parts of the world. The rate is uniform: five cents per ounce or fraction of an ounce for letters, two cents for

postal cards, and one cent for newspapers. Samples of merchandise may be sent at the rate of four ounces for two cents. Letters may also be registered on the additional payment of eight cents. By a special arrangement, domestic rates of postage apply also to Germany, United Kingdom, Canada, Mexico, and Cuba. A letter, for instance, may be sent from the United States to any office in these countries at the regular rate of two cents. Mail for the Philippines, Porto Rico, and other American possessions is charged domestic rates also. A United States postal agency has been established at Shanghai, China. Letters intended for over twenty Chinese cities may be sent through this agency at the domestic rate of two cents per ounce. At present the postoffices of the world are transmitting about 30,000,000,000 letters and 15,000,000,000 newspapers yearly.

The following table of postal distances and time from New York City is taken from the Official Postal Guide, showing the distance by shortest routes and time in transit by fastest mail trains from New York City:

Cities.	Miles.	Hours.
Albany, N. Y.	142	3½
Atlanta, Ga.	882	24¼
Baltimore, Md.	188	6
Bismarck, N. D.	1,738	60½
Boise, Idaho	2,736	92½
Boston, Mass.	213	6
Buffalo, N. Y.	410	9½
Carson City, Nev.	3,036	109¼
Charleston. S. C.	804	21¼
Chattanooga, Tenn.	853	32
Cheyenne, Wyo.	1,899	54
Chicago, Ill.	900	24
Cincinnati, Ohio	744	23
Cleveland, Ohio	568	19½
Columbus, Ohio	624	20
Concord, N. H.	292	9½
Denver, Colo.	1,930	61½
Des Moines, Iowa	1,257	37½
Detroit, Mich.	743	21
Galveston, Texas	1,789	56½
Harrisburg, Pa.	182	6
Hartford, Conn.	112	4
Helena, Mont.	2,423	86
Hot Springs, Ark.	1,367	55
Indianapolis, Ind.	808	23
Jacksonville, Fla.	1,077	30
Kansas City, Mo.	1,302	38¼
Louisville, Ky.	854	30
Memphis, Tenn.	1,163	40
Milwaukee, Wis.	985	29¼
Minneapolis, Minn.	1,308	38
Montgomery, Ala.	1,057	26
Montpelier, Vt.	327	10¼
New Orleans, La.	1,344	32
Omaha, Neb.	1,383	43
Philadelphia, Pa.	90	3
Pittsburg, Pa.	431	13
Portland, Me.	325	12
Portland, Ore.	3,181	114½
Prescott, Ariz.	2,724	94
Providence, R. I.	189	5
Richmond, Va.	344	11¼
St. Louis, Mo.	1,048	29
St. Paul, Minn.	1,300	37
Salt Lake City, Utah	2,452	71½
San Francisco, Cal.	3,250	105
Santa Fé, N. Mex.	2,173	82
Savannah, Ga.	905	26¼
Seattle, Wash.	3,200	102
Tacoma, Wash.	3,209	102
Topeka, Kan.	1,370	48
Trenton, N. J.	57	2
Vicksburg, Miss.	1,288	50
Washington, D. C.	228	6
Wheeling, W. Va.	496	14¼
Wilmington, Del.	117	5
Wilmington, N. C.	593	20

Potash. See POTASSIUM.

Potassium, a bright, silvery metal lighter than water. At ordinary temperature it may be cut with a knife, but at the freezing temperature of water it becomes brittle. Its affinity for moisture is so strong that if a bit be laid on water it decomposes the water; part of the potassium unites with the oxygen, part unites with the hydrogen, burning with a characteristic blue flame. Potassium cannot be kept in the open air, but is protected usually in bottles and is covered with oil. Potassium forms many compounds. One of the best known is potash, a solution of which, obtained usually from wood ashes, is called lye. Another well known compound is saltpeter, the potassium nitrate used in making gunpowder. Potassium has too great an affinity for other elements to be found free in nature. It is widely distributed. It forms a part of many rocks and, by their disintegration, enters into the composition of most soils. It is stored up by plants and becomes a part of the bodies of animals. The eke or oil exuded by the body of the sheep and found on wool is strong with potassium. Metallic potassium is prepared by a process of distillation. Pearlash is heated with charcoal in a red-hot iron retort—a process not without danger. The pearlash, or carbonate of potassium, was obtained formerly from wood ashes, but the greasy products of wool and a residuum obtained in the manufacture

of beet sugar now yield the greater part of the pearlash from which the potassium of the arts is prepared. In a compound form potassium enters into the makeup of saltpeter, gunpowder, potash, soap, alum, cream of tartar, and "caustic."

Potato, a well known plant of the nightshade family. It is a native of Chile and Peru. A wild variety is found as far northward as the mountains of Colorado. The potato was cultivated quite generally by the American Indians before the discovery of America. It was carried to Spain from Peru early in the sixteenth century. Sir Walter Raleigh is said to have brought specimens from Virginia in 1585. For a century or so the potato was cultivated in European gardens as a curiosity, and was regarded by scientists as of mere botanic interest. It became a field crop first in Ireland. In 1772 Frederick the Great introduced the culture in Prussia. One-eighth of the arable land of that country is now devoted to raising potatoes. Potatoes are so important a crop in Ireland that they are jocularly called "Irish apricots," or "Munster plums."

The potato is the most popular of all vegetables. The name was first and properly applied to the sweet potato or native *batata*. It is so used in the South to this day, the common potato being known by way of distinction as the Irish potato; but the error has been passed over, and it is too late to save the potato from going under a stolen name. Being native of the Andes, it has been called, poetically enough, "the apple of Peru."

The potato is related closely to the tomato, ground cherry, and egg-plant. It is allied to tobacco. The stalk, leaves, blossom, and fruit of the potato and of the tomato vine are quite alike. By fruit we mean, of course, the green "potato ball" that succeeds the blossom late in autumn. A cross section of a potato ball shows that it resembles a tomato very closely in shape and in the arrangement of the cells and seeds. The fruit of the potato plant is unfit for food. The edible portion is the swollen starchy end or tuber of an underground stem. The potatoes do not grow on roots, but terminate underground stems. Roots branch, but do not have buds. The eyes of a potato are buds. They all point upward or away from the center of the plant and are most numerous at the extreme end of the stem or tuber. When kept from frost over winter the eyes or buds sprout and produce new plants. The tomato-like seeds in the potato balls are sometimes planted by way of experiment. They are like apple seeds in that they do not come true or produce potatoes like those grown on the parent vine. In this way new varieties may be developed.

The potato contains seventy-eight per cent of water and eighteen per cent of starch. As an article of diet it is deficient in nitrogen and fat. It should be supplemented by such articles of food as oatmeal, butter, gravy, eggs, beans, and meat. Potatoes contain a trifling amount of an alkaloid poison akin to the nicotine of tobacco. It resides chiefly in the skin. It escapes during boiling and gives the characteristic odor of boiling potatoes.

As stock food potatoes belong to the same general class as corn and other starchy foods. A bushel of potatoes furnishes somewhat over one-fifth as much food as a bushel of corn. It is profitable, therefore, to sell potatoes at twenty-five cents and buy corn at one dollar per bushel. Professor Henry of the Wisconsin Station claims that four and a half pounds of boiled potatoes are equal to a pound of cornmeal in feeding value for hogs. To the animal, potatoes may be fed raw, but they should be sliced to prevent choking, and should be combined with food having a high per cent of nitrogen, as clover or alfalfa.

Gardeners have taken pains to improve the potato. The large, mealy tuber now placed on the table is different from the small, watery potato first made known to Europeans. The world's potato crop is dependent on weather and soil conditions. The United States has so great a diversity of soil and climate that a fair crop is to be expected somewhere between Maine and California. It has happened that the entire potato crop of a country like Ireland has rotted in the ground by reason of a wet autumn. The following statistics are to be regarded therefore with caution, as they do not represent the yield of any one year, nor are they complete. They were given

out by the United States Department of Agriculture for an average potato crop:

Country	Bushels
United States	346,823,000
Canada	107,346,000
Hungary	45,592,000
Belgium	93,329,000
Bulgaria	1,650,000
Czecho-Slovakia	136,429,000
Denmark	53,087,000
Finland	19,531,000
France	323,527,000
Germany	985,234,000
Italy	55,116,000
Jugoslavia	34,906,000
Netherlands	84,768,000
Norway	27,305,000
Rumania	3,226,000
Poland	567,083,000
Spain	102,225,000
Sweden	62,390,000
Switzerland	25,213,000
United kingdom	244,686,000
Japan	47,278,000
Algeria	653,000
Union of South Africa	3,367,000
Ireland	74,140,000
Lithuania	37,000,000

The economic conditions of some of the potato raising countries of Europe make it impossible to take an agricultural census, and it is these states that are not represented in the table, which is otherwise complete.

For the year 1921 the potato crop of the United States was as follows:

State	Bushels
Maine	37,152,000
New Hampshire	2,240,000
Vermont	3,750,000
Massachusetts	3,335,000
Rhode Island	345,000
Connecticut	2,369,000
New York	33,990,000
New Jersey	9,025,000
Pennsylvania	21,586,000
Delaware	500,000
Maryland	3,185,000
Virginia	14,688,000
West Virginia	4,080,000
North Carolina	4,048,000
South Carolina	2,550,000
Georgia	1,725,000
Florida	1,564,000
Ohio	6,728,000
Indiana	3,570,000
Illinois	6,413,000
Michigan	27,200,000
Wisconsin	21,420,000
Minnesota	27,525,000
Iowa	4,128,000
Missouri	4,756,000
North Dakota	11,520,000
South Dakota	4,400,000
Nebraska	8,160,000
Kansas	4,160,000
Kentucky	3,770,000
Tennessee	1,820,000
Alabama	2,400,000
Mississippi	1,088,000
Louisiana	1,809,000
Texas	2,072,000
Oklahoma	2,088,000
Arkansas	1,815,000
Montana	5,060,000
Wyoming	2,052,000
Colorado	11,070,000
New Mexico	296,000
Arizona	460,000
Utah	2,415,000
Nevada	592,000
Idaho	10,545,000
Washington	7,425,000
Oregon	3,870,000
California	10,064,000

See ALCOHOL; STARCH; BURBANK; TOMATO.

Potato Beetle, an insect pest, popularly but less correctly called potato "bug." The potato beetle is called *decemlineatus,* or ten-striped, by entomologists. When first known the Colorado potato beetle dwelt along the eastern base of the Rocky Mountains, feeding on the leaves of a wild, spiny ground cherry that belongs to the potato family and is called locally a "sand-bur." In 1856 this beetle fell upon a field of potatoes 100 miles west of Omaha. It journeyed steadily eastward, and by 1874 it had extended its ravages to the Atlantic. C. V. Riley, the noted entomologist, says, "It never quits a locality when it obtains a foothold." The adult beetle passes the winter in the ground and in the spring flies about on broad, rose-colored wings until it finds young potato tops. It even burrows into the potato hills to meet the rising sprouts half way. As soon as the young tops appear the female attaches a cluster of twenty to forty oval orange-colored eggs to the under side of a leaf. In the course of a week tiny hump-backed larvae of a venetian red color appear and betake themselves to feeding vigorously on the leaves of the plant. They have a faculty of climbing to the very tip of the growing stalk where the young leaf is tenderest. As the larva grows older it becomes paler in color and its sides are marked by two rows of black spots. In about three weeks it enters the ground and makes a burrow in which it remains for a few days,

emerging a perfect beetle with striped wing covers. From egg to beetle is a period of four to six weeks. The female beetle lays 400 or 500 eggs in a season, and, under favorable circumstances, the fourth generation, great grandchildren, mature into adults before winter.

See POTATO; SPRAYING; BEETLE; PARIS GREEN.

Potawatami, a tribe of the great Algonquian family of North American Indians. The name, which is more properly spelled *Potewatmik,* means *fire makers,* and derives from this tribe's custom of building a separate council fire when they met in conference with other tribes. They once held the greater part of the land around lower Lake Michigan, as far south as the Wabash River and west as far as central Illinois.

In the Colonial wars the Potawatami fought with the French, and they took a prominent part in the conspiracy of Pontiac (see PONTIAC). In the Revolutionary War and again in the War of 1812 they fought with the British. After 1840 a great part of these Indians had sold their land and migrated beyond the Mississippi River; later they moved southward, and the largest group is now in Oklahoma. Other groups are to be found in Indiana, Michigan, Wisconsin, Ontario and Kansas.

Potential, a term introduced into physics by La Place, and which has come to have great importance in electrical science. As here used the potential of a body is its electrical condition which determines the transfer of electricity between it and other bodies. The body from which the electricity flows is said to be at the higher potential. It does not mean quantity of electricity; the body having the greater charge may be at the lower potential, for its capacity may be much greater. An understanding of potential is best obtained by the water-level analogy. It is not quantity of water which causes a flow, but difference of level. Potential is likewise analogous to temperature. It is not the quantity of heat in two bodies which determines which way heat will pass if they are brought into contact; the one at the higher temperature gives up some of its heat. The rate at which the electrical flow takes place, or the current, depends upon the difference of potential. Electromotive force is used synonymously with difference of potential.

Potomac, an important river of the Chesapeake region. It forms the boundary between Maryland and the Virginias. The total length is about 400 miles. The chief branches are the Shenandoah from the south and the Monocacy from the north. The upper course of the river is much interrupted by rapids. At Harper's Ferry it has cut one of those famous passages known as a water gap. Between Harper's Ferry and the city of Washington there are numerous rapids and falls. The Great Fall, a cataract about thirty-five feet high, is situated a dozen miles or so above Washington. The river is navigable for sea-going vessels as far as Washington. It was at one time a river of commercial importance; the early settlers of Virginia and Maryland packed their tobacco in hogsheads, rolled them down woodland roads to the Potomac or its branches, and shipped them to England. The upper valley was one of the earliest thoroughfares to the interior. The Chesapeake and Ohio Canal was built along its banks. The river is rich in historical associations. Its broad expanse was the delight of George Washington. See MOUNT VERNON; WASHINGTON, etc.

Potosi, pō-tō′sĭ, a city of Bolivia. It is situated in the province of the same name about 100 miles southwest of the capital, Sucre. Like Butte and Virginia, it is pre-eminently a mining city. It is situated at an elevation of 13,000 feet above the sea, being one of the highest inhabited places known. Silver mines were opened as early as 1545. The Spanish crown opened a royal mint for the convenience of the miners. Silver to the value of $3,000,000,000 has been mined here. A hundred years after the opening of the mines the population was estimated at 150,000. The mines are now less productive than formerly and the town has a deserted appearance. At present there are 29,800 people. The mint, the cathedral, several convents, churches, and other public buildings attest the former importance of the city.

Potsdam, a summer residence of the former German emperors situated about seventeen miles southwest of Berlin on an

island of the Havel. There are a number of lakes and canals spanned by well constructed bridges. Potsdam bears much the same relation to Berlin that Versailles holds to Paris. It was originally a Wendish fishing village. In 1660 the Great Elector chose it as the site for a palace. Frederick the Great located his palace and gardens of Sans Souci here. Successive kings of Prussia beautified the place. It is now a town, or rather a region, of extensive parks, boulevards, palaces, museums, churches, and barracks, together with residence and manufacturing sections. It has a population of about 59,600. There are several large sugar refineries and breweries. A strong garrison of soldiers is maintained. Public squares are ornamented with statues and trophies of war. Both Frederick the Great and his father were buried here. Sans Souci is a rambling, one-story palace built on an artificial terrace. It is disappointing in appearance, but it is none the less interesting as having been the home for many years of Frederick the Great. His rooms and personal belongings are preserved scrupulously in the condition in which he left them. The clock, stopped at the moment of his death, stands silent. A room once occupied by Voltaire is shown also to visitors.

Pottery, earthenware. In its widest sense the term includes all objects made of plastic clay hardened by fire. In ordinary usage, however, the coarser sorts, as brick, sewer pipe, roof tiling, pavements, etc., are excluded. Well baked pottery is the most durable of all substances. It will neither rust, dissolve, nor disintegrate. So far as the effect of time is concerned, an earthenware plate will outlast an iron kettle. Pottery is classed usually as soft pottery, stoneware, and porcelain. Common flowerpots, Greek vases, cheap earthenware, and majolica are examples of soft pottery. They can be melted in an intense fire. Stoneware is harder and has been burned more thoroughly. Porcelain differs from stoneware again in being whiter and semitransparent. It is the most difficult of pottery to fuse.

In forming a piece of pottery of whatever class the clay is first freed from all impurities and grit. It is then mixed into a thick paste with which to form the body. The proportion in which the ingredients are mixed and the requisite degree of stiffness are secrets of the potter's art, guarded by all large establishments with care. In making an article, the potter takes a piece of clay and fashions it between his hands on a potter's wheel. The latter is a small, circular table resting on a pivot, so as to revolve readily. The most primitive potter's wheel is turned by hand. The Egyptians used an improved form of wheel. A lower table, larger and heavier than the first, was attached to the same axle, so that the workman might cause it to spin around with his foot, thus leaving both hands to shape the clay. As the lump of clay whirls with the table the workman molds it with his hands, as in a lathe. If of just the right consistency the paste shapes itself with wonderful ease and regularity. As the potter raises or lowers his hands, spreads them, or brings them closer together, the clay follows, rising or falling, spreading or curving, and shaping itself into a plate, cup, or vase, almost as though it seems to realize what is wanted of it.

The potter's wheel appealed to the ancients as a marvelous invention. The Egyptians claimed that it was given to man by the immortal gods, and that the first man was fashioned on it. Homer compares the spinning of the potter's wheel to the rhythm of the dance. Jeremiah compares the fashioning of clay on the wheel with the making and unmaking of nations under the Divine hand:

> Then I went down to the potter's house, and, behold, he wrought a work on the wheels. And the vessel that he made of clay was marred in the hand of the potter: so he made it again another vessel, as seemed good to the potter to make it. . . . O house of Israel, cannot I do with you as this potter? saith the Lord. Behold, as the clay is in the potter's hand, so are ye in mine hand, O house of Israel.

In modern factories the wheels are driven, of course, by power. An ingenious device permits each workman to regulate the speed of his own wheel. When the body of the article has attained the proper shape it is heated or fired in a kiln in order that it may be handled without loss of shape. Fat clays are those that shrink during firing; a lean clay, that is to say, one con-

taining a larger proportion of sand or flint, shrinks but little. Here again the proper proportion of fat and lean material requires experience and judgment. Sometimes old pottery is ground fine and added to the paste to serve as lean material.

The surface of pottery is coated usually with a glaze or enamel. Glaze is simply another word for glass. The article is dipped in a tank of liquid glaze and then fired again to harden it. It is necessary that the glaze and the body should be somewhat alike in material, or else the glaze will flake off in use. Lead is frequently added to a glaze to make it adhere to the clay body. Most gray wares are finished with a lead glaze. A glaze is transparent. The body may be seen through it. Enamel is a glaze having the addition of some material that makes it opaque. Enamel conceals the clay. Glaze permits it to be seen. Both enamel and glaze permit of high colors. The brown stone bottles, known sometimes as ginger beer bottles, are often finished with a salt glaze. Feldspar glaze is used to cover porcelain.

No pottery is found among the remains of the cave dwellers. Otherwise, bits of pottery are among the earliest relics of prehistoric man. The burial mounds of Europe contain specimens of a coarse brown pottery moulded apparently without the assistance of the potter's wheel. Some of them appear to have been built up from strips of clay; others to have been scooped out of a solid ball. They consist chiefly of urns full of burned bones, food vessels, drinking cups, and incense cups. They are unglazed. The ancients learned later, however, to make both glazes and enamels of wondrous beauty and brilliance. Copper and cobalt were used for blue and green; manganese for purple and violet; iron, lead, and copper for yellow and red; iron and manganese for black; tin for white, etc. They had a variety of tints, as turquoise, ultramarine, and deep indigo at their command. The finest decorated enamels are found on panels or slabs used for the walls of palaces. They are ornamented usually with artistic designs. Egyptian plaques, votive figures, cups, bowls, goblets, vases, wine jars, and bottles, in a great variety of shapes and colors, are shown in the British Museum and at the Louvre. From the ruined palaces of Babylon and Nineveh a variety of tablets, tiling, vases, urns, jars, and cups have been recovered either entire or in fragmentary condition. Much has been learned of customs and even the history of the Euphrates Valley from the decorations of pottery. The Phoenicians, prehistoric Greeks, and the Etrurians were noted for their pottery. Etruscan vases are still unsurpassed for symmetry of shape. The Greeks, Romans, Arabians, and Moors, the Teutons, the Saxons, and the Gauls developed styles of pottery known to the expert at a glance. The Chinese and Japanese are celebrated especially for their porcelains. The development of pottery among the modern nations of Europe is an exceedingly interesting topic. Volumes have been written on the productions of each country.

Like other primitive people, the prehistoric Indians of the New World had their earthenware. Even the piles of earth made by the mound builders contain specimens of rude pottery. The corn-raising tribes of Indians burned large urns in which to store their grain. In the absence of other fuel the Indians of the West were accustomed to burn their pottery with piles of dry buffalo dung. The Pueblo and other Indians are famous yet for native pottery. It is built up in strips. Many specimens indicate that the clay was built on a basket that was burned out in firing.

The earliest pottery in the colonies of which we have record was established at Burlington, New Jersey, in 1685. Others were established in South Carolina in 1765; in Philadelphia in 1769, etc. During the first quarter of the nineteenth century Americans were dependent largely upon England for crockery. Very ordinary plates were worth twenty-five cents apiece. The census of 1920 reported 340 establishments, employing 27,934 wage earners, with an annual output worth $75,000,000. Trenton, New Jersey, and East Liverpool, Ohio, are the chief centers of American pottery manufacture. Trenton alone has forty establishments engaged in the manufacture of earthenware, including china, semi-porcelain, white granite, bath tubs, tiles, terra cotta, etc., with a total value of

$12,000,000 a year. About half of this sum is to be credited, however, to the coarser forms of earthenware not usually regarded as pottery.

See AMPHORA; DELFT; KAOLIN; MAJOLICA; PORCELAIN; SATSUMA; SEVRES; WEDGEWOOD; BRICK; ADOBE; TALC.

Pottstown, Pa., an industrial borough, is 40 miles northwest of Philadelphia on the Schuylkill River, and on the Pennsylvania and the Philadelphia & Reading railroads. Chief among its manufactures are rolling mill products, steel bridges, agricultural machinery, boilers, nails, cigars, lumber, machine shop products, silk, shirts and hosiery. The city is the commercial center for a fertile agricultural region that has also a considerable mineral wealth. It contains the Hill School for Boys, modern public schools, a library and handsome municipal buildings. In 1920 the population was 17,431.

Pottsville, Pa., an industrial city and the county seat of Schuylkill County is situated on the Schuylkill River near its source and on four railroads, 95 miles northwest of Philadelphia. It is in the Schuylkill anthracite coal fields, and is a shipping point for much of the coal mined here. The principal manufactures are knit goods, silk, shirts, shoes, wood-working machinery and steel. It has a high school, a public library and the Pottsville Athenaeum and Library. In 1920 the population was 21,785.

Poughkeepsie, N. Y., is an important educational center and the county seat of Dutchess County. It is 72 miles north of New York City on the eastern bank of the Hudson River and on several railroads. The city has a fine location on a plateau about 200 feet above the Hudson. It is the seat of Vassar College, whose spacious grounds and fine buildings are immediately east of the city. Here also are Putnam Hall, Eastman Business College, Adriance Memorial Library and the Hudson River State Hospital for the Insane. It has manufactories of celluloid goods, mowing machines, cream separators, plows, shoes, chairs, window blinds and other articles. Poughkeepsie was for a time the state capital, and here in 1788 the state convention met that ratified the Federal Constitution. Population in 1920, 35,000.

Poultry, the collective name for all domesticated birds, has in recent years come to be applied almost exclusively to chickens because of their importance in the economy of some of the countries of the world, notably the United States.

Poultry raising is a very profitable industry, but if gone into without a basis of proper knowledge it is likely to be attended by failure. Housing, feeding and breeding are the subjects about which too little is learned by some would be poultry raisers, while some others, having a general knowledge of these subjects, attempt to apply the general rules indiscriminately to any and every breed. There are about fifteen breeds of chickens that are well known in the United States, and in some detail each requires different care.

Between the years 1910 and 1920 the number of every domesticated bird except the chicken and the guinea fowl decreased. The number of chickens in the United States in 1910 was 280,340,959, while in 1920 it was 359,537,127, an increase of more than 79,000,000 in ten years. The greatest number are raised in the west north central group of states, while the New England states have the least. Iowa with more than 27,000,000 is the greatest single producer; Illinois is second. In 1920 the United States had 3,627,028 turkeys, 2,817,624 ducks, 2,939,203 geese, 2,410,421 guinea fowls and 1,493,630 pigeons.

He who would be successful in the raising of poultry should study a few good books on the subject, such as the *Productive Poultry Industry,* by Lewis and the *Principals and Practice of Poultry Culture,* by Robinson, and should if possible keep familiar with the subject by reading one of several standard poultry magazines. See CHICKEN; DUCK; TURKEY; GOOSE; GUINEA FOWL; PIGEON.

Pound. See MONEY.

Pound, the unit of mass in the English system, derived from the Latin, pondus, meaning weight. Its use in England has come down from the time of William the Conqueror, but varied somewhat from the value of today. In the avoirdupois system

it now has 7,000 grains, and in the Troy 5,760 grains. A weight of silver equivalent to one pound came to be the money unit and was called the pound also. The idea of weight was dropped and the pound is now equivalent to twenty shillings. To avoid confusion with the weight unit, the coin is called a pound sterling.

Poundal. See DYNE.

Poussin, poos-sang′, **Nicholas** (1593-1665), a noted French painter of historical and landscape pictures. A native of Normandy. He was educated at Paris. *The Deluge,* painted for Cardinal Richelieu, hangs in the Louvre with many of his best works, "admired rather as a duty than enjoyed by the spectator."

Powder. See GUNPOWDER.

Powderly, Torence Vincent (1849-), an American labor leader. He was born at Carbondale, Pennsylvania, where he went to school until he was thirteen, leaving to begin work as a switch tender. In 1866 he moved to Scranton, where he became a machinist and worked for eleven years. In 1878 he was elected mayor of the city on the Labor ticket, and was twice reëlected for a two years' term. From 1879 to 1893 he was general Master Workman of the Knights of Labor. Then he began the study of law. In 1894 he was admitted to the bar of Lackawanna County and eight years later to practice before the United States Supreme Court. From 1897 to 1902 he was United States Commissioner-General of Immigration. He has written on economic subjects for various papers and magazines, and is the author of *Thirty Years of Labor, The History of Labor Day, The Problem of Today,* and *The Trusts.*

Powell, John Wesley (1834-1902), an American geologist. He was a native of Mount Morris, New York. He was a student at various institutions, including Oberlin. During the Civil War he served in an Illinois regiment, entering as a private and coming out a second lieutenant. Later he was made a professor of geology at Illinois Wesleyan University. He held various educational positions. In 1868 he explored the Grand Cañon of the Colorado River. Two years later he was placed in charge of a survey of that wonderful region. When the United States geological survey was established he was made director, a position which he held until 1894. He wrote a number of scientific works. His account of the exploration of the Colorado region is of thrilling interest. His was the first party of white men ever to pass through the cañon. He wrote also an introduction to the study of Indian languages. He died at Haven, Maine. See COLORADO RIVER.

Powell, Maud (1868-1920), a noted American violinist who during a successful career worked untiringly to bring out new, especially American, works for the violin. She was born at Peru, Ill., and received her musical education in Chicago, Leipsic, Paris and Berlin. She made her debut in Berlin in 1885 at a concert of the Berlin Philharmonic Society. Upon her return to the United States, Miss Powell won instant recognition. America's love and appreciation never wavered. In 1904 she was married to H. Godfrey Turner, of London. She toured Germany, Austria, England and South Africa, and after 1903 appeared every season in the United States. During her career Miss Powell was a soloist with many great orchestras, including those of Seidl, Thomas, Damrosch, Gericke and Nikisch.

Power. See HORSE POWER.

Power of Attorney, a writing or instrument by which one person authorizes another to do some act or acts for him, as to collect rents, sell real estate, execute a deed, sign checks, etc.; also called "letter of attorney." Such an instrument constitutes the person to whom it is given an agent or attorney of the person giving it.

A power of attorney may be either general or special. A general power of attorney authorizes the agent to act generally for the principal; a special power limits the agency to some special purpose, or to particular things.

Power, in point of law, means an authority given to some person who would otherwise not be entitled to do the specific thing or things in question. But the ordinary power of representing a principal, given to an agent in the ordinary course of commercial business, is not usually called a

power of attorney, although the latter power may be conferred either by parole (word of mouth) or by writing under seal. The attorney or agent cannot execute a sealed instrument that will bind his principal, unless the power is given to him under seal. Nor can authority given to a person be transferred by him to another, unless it is so provided in the original grant. The courts construe instruments of this kind very strictly, and all the conditions set forth in a power of attorney must be observed to legalize the attorney's action.

In signing the name of another person under a power of attorney, the agent usually writes, first, the principal's name; then the words "By (his own name), Atty." or "Atty. in fact." The death of the principal revokes the power of attorney at once, rendering void future acts as attorney.

Authority to perform a specific act given in a power of attorney, containing also general words, is limited to the particular act authorized; in effect, therefore, the general words have no meaning. Justice Field, of the United States Supreme Court, said on this point: "Undoubtedly it is a rule that a special power of attorney is to be strictly construed, so as to sanction only such acts as are clearly within its terms; but it is also a rule of equal potency that the object of the parties is always to be kept in view, and where the language used will permit, that construction should be adopted which will carry out, instead of defeating, the purpose of the appointment." Where the object, therefore, and sole object, of the power relates to one particular thing, though it may contain general words referring to other matters, these have but little or no legal effect.

The marriage of a woman revokes any power of attorney she may have previously given, and should the attorney or agent afterward execute a deed in her name, it would convey no title, unless the attorney has an interest of his own in the land. Nor does an unmarried woman who has given a power of attorney to confess judgment on her bond, or note, revoke her power by marriage.

Under the laws of homestead, neither husband nor wife, nor both by a mutual conveyance, can confer on the other the power to sell and convey the homestead by a single deed. Furthermore, a power of attorney given by a wife to her husband to sign deeds and mortgages, etc., but not describing any particular real estate or referring in any way to their homestead, is too indefinite to authorize him to execute a mortgage on the homestead signed by him for himself and as attorney-in-fact for her. A mortgage thus executed is void.

Where a person has been given a power of attorney to sign checks, and no other purpose is mentioned, it has been held by the courts that this power was not broad enough to cover also the acceptance of time drafts by the agent, though the same signature was used as in signing checks. Where a bank accepted such a signature as sufficient for the acceptance of a draft, the court held that the bank should have called for the production of the original power of attorney to satisfy itself that the agent had been given power to accept drafts as well as to sign checks; and that the bank took its chances of recovery if it did not call for the production of the power. This shows how strictly courts will construe a written power of attorney, for the protection of the principal.

In promissory notes, a written authority is often given by a debtor to an attorney named by the creditor, or to any attorney who may be subsequently named, to confess judgment for the debt. This power is usually called a warrant of attorney, and in some states renders the note non-negotiable, though, in most states, it does not affect the negotiability of such a "judgment note."

Powers, Hiram (1805-1873), an American sculptor. He was a native of Woodstock, Vermont. He died at Florence, Italy. He was educated in the district schools. The family moved to Ohio. He served an apprenticeship as a clockmaker and "found himself" in charge of the waxwork department of a museum in Cincinnati. He showed so much ability in modeling wax figures of notable people that he was encouraged to move to Washington. Here he modeled the busts of a number of dis-

tinguished men. In 1837 he set up a studio at Florence, Italy, where he resided for the rest of his life. His most noted statues are *Eve Tempted* and *The Greek Slave.* The latter has been copied widely. Powers executed the statue of Webster for Boston. He also made statues of Franklin and Jefferson, a statue of Washington for the state of Louisiana and of Calhoun for South Carolina. He made busts of Adams, Everett, Van Buren, Longfellow, and Jackson.

Powhatan (1550-1680), a chief of the Powhatan Indian tribe; his real name was Wahunsonacook. See POCAHONTAS.

Pragmatism. See JAMES, WILLIAM.

Prague, the capital of Czecho-Slovakia, and of Bohemia at the time that country became, after the World War, a part of Czecho-Slovakia. It occupies a picturesque situation on the banks of the Moldau. It is known as a city of a hundred towers. The river is spanned by nine bridges. Karlsbrücke, or Charles Bridge, over 1,600 feet in length, dates from 1357. It is guarded by tower. The buttresses are adorned with thirty statues and groups of saints. An inscription states that they were completed with money exacted from a Jew in 1606 as a fine for reviling the cross. The ancient walls of the town have been torn down to make room for boulevards and gardens. The city is divided into several quarters. One of these, known as the Altstadt, or Old City, is the chief seat of commerce. Another is known as the Jews' Quarter. There are important manufactures of embroidery, silk, woolen, cotton and linen cloths, boots, leather, soap, paper, hats, gloves, candles, musical instruments, porcelain, jewelry, and firearms. The city is celebrated for its breweries. Several religious festivals are held during the course of the year. The wool fair, which lasts for a week, is attended by dealers from all parts of Europe. The city is situated in a country of unusual fertility and close tillage, giving it the command of a large wholesale business.

Prague is of interest to the traveler. The University of Prague, the first in Germany, was established in 1348. The city was at this time the most important in Germany. Huss and Jerome were among the earlier professors. Two centuries later Copernicus and Tycho Brahe were connected with the astronomical observatory. There were at one time 10,000 students. It is still one of the most important universities in Christendom. There are over 300 professors and above 4,000 students. Instruction is carried on in duplicate. One faculty uses the German language; the other the Czech or Bohemian tongue. There is a library of 200,000 volumes, an astronomical observatory of the first rank, serviceable museums, botanical gardens, etc. While Prague possesses no single museum or art collection of the first class, it is still a city of unusual individuality. Quaint medieval carvings and sculptures can nowhere be seen to better advantage. The bridges, statues, monuments, cathedrals, the town hall, the old castle, and numerous palaces are interesting, not only from an artistic point of view, but on account of associations. A museum in one of the city parks gives an excellent picture of early peasant life among the Bohemians. There are models of the interiors of peasant cottages, with furniture, costumed figures of the country, and representations of the household arts — all instructive and interesting. The present population is about 76,476.

See BOHEMIA; HUSS; BRAHE.

Prairie Dog, a heavily built animal of the squirrel family. It is about sixteen inches in length and much resembles its smaller relative, the prairie squirrel. It is more agile and is neater in appearance than the woodchuck, to which also it is related closely, and which it seems to replace in the western plains. It may be found from Montana to Louisiana. It lives in large colonies, in what are known as prairie-dog towns. Each family has a burrow extending down to a considerable depth. The prairie dog feeds on vegetable matter, grasses, and roots. Like the woodchuck and ground squirrel, it seems to stay reasonably near its burrow. When the colony scatters to feed, sentinels are posted to give the alarm. In case of danger the little creatures scamper home. They have a habit, squirrel like, of sitting up to look about. If one approaches a dog town without creating too great an alarm, the citizens may be seen sitting up at the entrances to their burrows. On nearer approach, they dive

in head first with a short bark, but a few minutes later noses and eyes may be seen peering out to note what is going on, and, if there seems to be no particular cause for fear, the prairie dogs come up and sit as before.

A small burrowing owl and a rattlesnake have the reputation of sharing the burrows of these inoffensive animals. Without a doubt both animals are unwelcome. The community seems to get on with harmony only because the dogs have no way of driving the intruders away. It has been supposed that the owl, in particular, fed on young prairie dogs; but an examination of many stomachs shows that the diet of the owl consists of grasshoppers and other insects of the plains. So far as the case of the rattler is concerned, it is known that if a snake be caught far enough below ground, the owner of the burrow summons his companions with a shrill squeak, and that the entire colony goes to work excitedly scratching in soil and gravel to bury the rattlesnake alive if possible.

The *Year Book* of the Department of Agriculture for 1901 gives an account of a colony of prairie dogs in northern Texas. This region, 250 miles long by 100 miles in width, is estimated to contain an average of twenty-five burrows to the acre. Mr. Merriam estimates that the number of dogs in this colony can not be less than 400,000,000. Continuing his calculations, and allowing that thirty-two prairie dogs consume as much grass as a sheep, and 256 dogs as much as a cow, he estimates that the grass annually eaten by the pests in this colony would support 1,562,500 head of cattle. The prairie dog occupies lands too dry for general cultivation, and shows little disposition to wander eastward into the Mississippi Valley, but, where irrigation has led to the cultivation of fields, he forsakes his buffalo grass and, like the woodchuck of New England, feasts on clover and other crops to their rapid destruction.

In 1890 two pairs of prairie dogs were turned loose on Nantucket Island, Massachusetts. They increased so rapidly and became such a pest that in 1900 the town expended over $500 in their extermination. The ranchers and land owners of the West poison off the prairie dogs by scattering wheat or corn soaked in a solution of strychnine.

A typical burrow described in the report mentioned above descended fourteen and a half feet on a slight slant, then turned abruptly at right angles and ran thirteen and a half feet in a horizontal or slightly ascending direction. Several side chambers were connected with the horizontal portion. A pouch two or three feet below the surface is evidently intended as a temporary resting place or chamber in which to turn around in case the dog desires to come up again.

Prairie Hen. See GROUSE.

Pratt Institute, a co-educational, polytechnic institution established in Brooklyn, New York, in 1887. The school was founded by Charles Pratt. The following departments are represented: fine arts, domestic art, domestic science, science and technology, physical training, the high school, kindergartens, and libraries, including a library school. As is suggested by these varying fields, the aim of the institution is to further manual and industrial education and to promote the study of literature, science, and art. The course in domestic science is one year. Two years are required for the normal courses in fine arts, domestic arts and sciences, manual training, and kindergarten. The general art course is four years. The evening classes are well patronized and at the end of a completed course of evening work certificates are given in almost all the departments. The kindergarten course is for children from three to six years old. In addition there is a mother's course. The library is well equipped. It possesses 77,000 volumes, and in regard to general arrangement it is frequently referred to as model. There are seven buildings in all: the main building, the library building, the science and technology building, the electrical building, the high-school, the kindergarten building, and the gymnasium. The entrance age to general courses is sixteen, to normal courses, eighteen years. The attendance numbers about 4,500. It has become one of the popular and successful institutions of the country.

Praxiteles, praks-ĭt′e-leez, a famous sculptor of Greece. The details of his life

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